



Cattle feeding in the northern great plains
by Warren L Trock

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY in AGRICULTURAL ECONOMICS

Montana State University

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Abstract:

This is a study of the potential and prospects for development of cattle feeding in the Northern Great Plains, It is prompted by the widespread interest in feeding as an activity which will profitably utilize available resources and so contribute to the economic welfare of farmers, agri-businessmen and others.

To determine the potential for development of cattle feeding in the region, estimates of production of feed grains and cattle to 1975 are made. These estimates provide the limits for expansion, assuming no significant imports of grains or cattle into the region. The prospects for development are influenced by many factors, including capital requirements for expanded feeding enterprises, management or "know how", markets for fed cattle, transportation costs, etc. These are considered in the analysis.

Data relative to resource supplies, production practices, costs of production, markets, prices of fed cattle and beef, transportation costs, and other relevant factors are assembled from Experiment Stations, the United States Department of Agriculture, Statistical Reporting Services, private publications and a field survey of Montana cattle feedlots.

It is predicted that up to 1,5 million head of cattle will be fed in the Northern Great Plains by 1975, This is double the annual average number fed in the 1956-60 period and it represents 50 percent of the feeder cattle produced in the region by 1975, To achieve the projected level of output some reorganization of cattle feeding operations is envisioned. Many existing feeding enterprises will be expanded in size and will operate on a year around basis. Some new large scale. feedlots will be constructed in strategic locations.

An opportunity to participate in the growing western markets for beef is foreseen, but outlets for fed cattle may still prove to be problematic in the development of cattle feeding in the Northern Great Plains, The actions of meat packers in the region should be watched, for they may be the important link to interregional markets needed for maximum development of the feeding industry.

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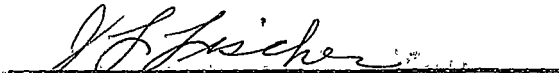
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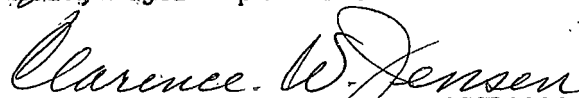
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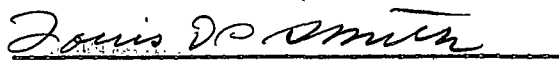
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All errors and omissions are the responsibility of the author.

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ABSTRACT

This is a study of the potential and prospects for development of cattle feeding in the Northern Great Plains. It is prompted by the widespread interest in feeding as an activity which will profitably utilize available resources and so contribute to the economic welfare of farmers, agri-businessmen and others.

To determine the potential for development of cattle feeding in the region, estimates of production of feed grains and cattle to 1975 are made. These estimates provide the limits for expansion, assuming no significant imports of grains or cattle into the region. The prospects for development are influenced by many factors, including capital requirements for expanded feeding enterprises, management or "know how", markets for fed cattle, transportation costs, etc. These are considered in the analysis.

Data relative to resource supplies, production practices, costs of production, markets, prices of fed cattle and beef, transportation costs, and other relevant factors are assembled from Experiment Stations, the United States Department of Agriculture, Statistical Reporting Services, private publications and a field survey of Montana cattle feedlots.

It is predicted that up to 1.5 million head of cattle will be fed in the Northern Great Plains by 1975. This is double the annual average number fed in the 1956-60 period and it represents 50 percent of the feeder cattle produced in the region by 1975. To achieve the projected level of output some reorganization of cattle feeding operations is envisioned. Many existing feeding enterprises will be expanded in size and will operate on a year-around basis. Some new large scale feedlots will be constructed in strategic locations.

An opportunity to participate in the growing western markets for beef is foreseen, but outlets for fed cattle may still prove to be problematic in the development of cattle feeding in the Northern Great Plains. The actions of meat packers in the region should be watched, for they may be the important link to interregional markets needed for maximum development of the feeding industry.

There are resources in the region which are available for utilization in cattle feeding enterprises, and there are good prospects for their profitable employment in these enterprises.

PART I

INTRODUCTION

The Problem Situation

A great deal of interest in cattle feeding is being expressed by farmers, ranchers, and businessmen in the Northern Great Plains.^{1/} This interest is prompted by the availability of feed, cattle and other resources in the region and prospects for profitable employment of these resources in cattle feeding enterprises. These are conditions that have developed in recent years. They have already resulted in an increase in cattle feeding, and an opportunity for further expansion appears to be sufficiently good to merit consideration of it.

Feed grains and cattle are basic to the development of cattle feeding enterprises. It is evident that they are available in the Northern Great Plains in quantities which will support an expansion in feeding operations. In 1960, production of feeder cattle in the region exceeded the number placed in feedlots by approximately 300 percent.^{2/} Most of these cattle were exported to the corn belt and other midwest feeding areas. This situation has prevailed for several years. In the same year, production of corn and barley exceeded the needs for cattle feeding by more than 600 percent.^{3/}

^{1/} The Northern Great Plains is defined for this study as an area including Montana, North Dakota, and South Dakota.

^{2/} Calculated from data in Table IV in text and Table X in Appendix.

^{3/} Calculated from data in Table VII in text and Table X in Appendix.

Some of this production was utilized by processors of human foods, but the bulk of it was sold as livestock feed or placed under loan with the Commodity Credit Corporation. Large stocks are presently on hand.^{4/}

Another resource that may be important to cattle feeding enterprises is labor. Indications are that labor in the region is in surplus supply. On January 1, 1960, there were 62,510 people unemployed in the three-state area, many of whom were farm laborers.^{5/} Farm employment has declined in recent years largely as a result of mechanization of operations, and experienced farm workers have been forced to seek jobs in non-farm industries.^{6/} They would probably welcome new opportunities for employment in agriculture.

A resource that will be critical to the development of cattle feeding enterprises is capital. While data on capital availability are not readily obtainable, there is evidence that many individuals and institutions are interested in investing in cattle feeding. Several corporate and co-operative feedlots have been organized recently, and they have been financed by farmers, cattle buyers, bankers, veterinarians, feed dealers and other businessmen. Farm feedlots have increased in number too. Many farmers have regarded

^{4/} See Table VII in Appendix.

^{5/} Data obtained from Unemployment Compensation Commissions of Montana, North Dakota, and South Dakota.

^{6/} Federal Reserve Bank of Minneapolis, Monthly Review, Annual Report Issue, Minneapolis, Minnesota, January, 1961.

cattle feeding as an outlet for feed and feeder cattle which is superior to selling these products, and they have expanded the investment of the region in feeding facilities. It appears that necessary capital is available.

A resource upon which the cattle feeding industry heavily depends for successful operation is management. This is an intangible resource composed of skills and abilities which are acquired by people through training and experience. It is difficult to define and identify, and the quality and quantity of this resource which is available in the Northern Great Plains is unmeasured. It is likely however, that managers can be found among experienced livestock producers, buyers and handlers of cattle, and others who have had opportunities to develop "know how".

Other resources will also be needed to develop cattle feeding enterprises, but they are of secondary importance and no problems are anticipated in acquiring them. It seems that the region is well endowed with the resources needed to expand cattle feeding operations.

The prospects for profitable employment of these resources in cattle feeding appear to be promising. It is generally expected that the demand for beef will be strong in the next ten to fifteen years and that increasing numbers of fed cattle will be required to meet the needs of consumers. While costs of feeding cattle have increased in recent years, profits have been realized by many feeders. It is expected that feeding enterprises, if efficiently organized and

operated, will continue to yield reasonable returns to capital, labor and management. But numerous factors affect profits in cattle feeding, and it is possible that not all of them have been given adequate consideration by those who view cattle feeding with optimism. These factors need to be identified and evaluated before any judgment is made about prospects.

Objectives of the Study

This study has as its objectives: (1) the determination of the potential for production of fed cattle in the Northern Great Plains, (2) the evaluation of prospects for development of cattle feeding in this region, and (3) the estimation of the extent of the development of cattle feeding in the Northern Great Plains by 1975.

Hypothesis

It is hypothesized that cattle feeders in the Northern Great Plains can be competitive with feeders in other regions in the markets for fed cattle and that cattle feeding will therefore develop in the region.

Procedure

Data were first assembled which are descriptive of the beef cattle industry in the United States. They serve to identify the regions--including the Northern Great Plains--that are important to this industry and to describe the production and marketing activities carried on in these regions.

Sources of data included U. S. Department of Agriculture reports and bulletins, experiment station circulars and bulletins from many states, census reports, trade publications and other secondary data. Personal interviews with cattle producers and feeders and Montana packers provided additional information which supplement the data. A study conducted by Robert Mueller produced information about costs of cattle feeding, economies of size in feedlots, and management practices.

An analysis of the potential for development of cattle feeding in the Northern Great Plains was next conducted. Projections of resource use and probable production of agricultural commodities are employed to estimate future output of feed and cattle in the region, and possible levels of production of fed cattle are described.

The evaluation of the prospects for development of cattle feeding in the Northern Great Plains is based on observations of problems, needs and potentials of production, an analysis of production costs, a study of possible market outlets, an analysis of marketing costs for fed cattle, and other pertinent factors.

Conclusions are drawn relative to the likely development of cattle feeding in the region, and suggestions are made which will facilitate this development.

PART II

THE ANALYSIS

Factors Affecting the Aggregate Demand For and Supply of Beef

Of first concern is the outlook for beef production and consumption in the United States. If the expectations for an expanded demand for beef are soundly based, and if conditions affecting the supply of cattle and beef are favorable to increased cattle production, then there is reason for the interest in cattle feeding in the Northern Great Plains. Some important factors affecting the supply of and demand for beef have been noted and are presented here.

Demand for Beef

Factors which affect the demand for beef include (1) population of the United States, (2) the disposable income of consumers, (3) tastes and preferences, (4) substitute foods, and (5) environmental conditions affecting food consumption. These factors are obviously not separable in the way they influence demand, and the list is not complete. But these are important factors which can be identified and evaluated.

The population of the United States is important to the demand for beef because it is the consuming public for this commodity. Markets for beef are largely domestic markets, with exports a relatively unimportant factor in the demand for beef.

Considerable increases in our population have been realized since the turn of the century, and the most rapid growth has taken place in the last twenty years. Between 1940 and 1960, the population increased

by 47.2 million people, about 45 percent of the total increase in 60 years. In the last ten years, 28.0 million people have been added to the population--about 25 percent of the total increase since 1900.^{7/} The rate of growth has been accelerating and present rates are relatively high. Since numbers of people are important to demand, such rapid increases in the population are significant.

An aspect of population growth that should be noted is the remarkable movement or shift of population that we have experienced. This shift has been from the East to the West and Southwest. In the single decade 1950-60, population of states west of the Mississippi increased from 60.3 million to 73.9 million. Several states in the West and Midwest realized rates of growth which exceeded that of the country as a whole, and California exceeded all states in the nation in population growth.^{8/} These shifts in population and consequent high rates of growth in western states may be important to the development of cattle feeding in the Northern Great Plains. They bring important consuming areas closer to Montana, North Dakota, and South Dakota.

Another factor that is important to the demand for beef is the per capita disposable income. It is rather uniquely related to beef consumption and will greatly influence demand. Rex F. Daly, of the

^{7/} See Table I in Appendix.

^{8/} United States Department of Commerce, Census of Population, 1960, Bureau of the Census, Washington, D. C., 1960.

United States Department of Agriculture, has found that livestock products in general show more response to changes in income than do most crops; and that consumption of beef, in a given framework of prices, is more responsive to changes in income than other meats.^{9/} Thus future levels of income will greatly influence the demand for beef and the requirements for fed cattle.

Per capita income has risen steadily since the time of the great depression.^{10/} The greatest increase in income appears to have been realized in the war time period 1940-45. But steady gains have been made since that time, and they have been important to food consumption.

Tastes and preferences of consumers for beef and other foods are difficult to measure and evaluate. Many factors influence the desire of individuals for food, and at least one factor--income--affects the expression of desire in the market place. Data concerning consumption were examined to discover trends in consumption over about 30 years.^{11/} It was found that consumption of most livestock products, fruits and vegetables has been increasing, while consumption of cereal grains, fats and sugar has declined. It has been pointed out that in this period of time, income was increasing and that the income effects on

^{9/} Rex F. Daly, "The Long Run Demand for Farm Products", Agricultural Economics Research, Volume VIII, United States Department of Agriculture, July, 1956.

^{10/} See Table II in Appendix.

^{11/} See Table III in Appendix.

the kinds of foods consumed are such that this pattern of consumption could have been expected. It seems quite probable that tastes and preferences, combined with increased purchasing power, has strengthened the demand for meats, fruits and vegetables.

A fourth factor which affects the demand for beef is substitute foods. Those which can be considered to be substitutes are largely other meats and various livestock products which are good sources of protein. Statistics relative to consumption show that poultry, eggs and dry milk have been increasingly utilized in the last 30 years, and that pork and fish consumption has been maintained at a fairly constant level. All of these are substitutes for beef, and the quantities, qualities, and prices of these products will determine how competitive they are. But if incomes continue to rise, and if price relationships do not vary significantly, beef should continue to hold its market position.

A fifth factor which influences the demand for beef is the environmental conditions which affect consumption. The threat of war is a condition that supports demand through its influence on employment, income, prices, etc. A third world war would have unpredictable positive effects on the supply of and demand for food. Recessions have a depressing effect on beef consumption, because the use of beef responds so readily to income changes. Natural disasters, such as floods, violent storms, droughts, and severe winters, produce locally heavy demands for food. Economic disturbances such as strikes and layoffs cause food

purchases to drop off. Occurance of any of these events can only be guessed at and so they are not considered in this report.

The prospects for a continuing strong demand for beef appear to be good. The population is expected to increase at a substantial rate, and food requirements will grow with it. Incomes are expected to rise as economic development is realized, and more money will be spent for food. Consumers will be in a better position to express taste and preference for food, and beef should be a favored food item.

Supply of Beef

The supply of beef is influenced by numerous factors including (1) the resources employed in beef production, (2) the organization and management of these resources, (3) methods and technology used in production, (4) changing specifications for beef, and (5) national agricultural policy. These factors, like those affecting demand, are inseparable in the influence they have on the supply of beef. But their effects need to be recognized so that future production may be predicted.

It has been noted that the resources basic to the production of fed cattle are feed grains and feeder cattle. It will therefore be useful to consider briefly the history of and potential for production of these resources.

In the last ten years, there have been some important changes in feed grain production in the United States. As shown in Table I, output of corn, barley, and grain sorghums has been increased, while production of oats has decreased only slightly.

TABLE I. PRODUCTION OF FEED GRAINS, UNITED STATES, SELECTED YEARS
1950-60.*

Date	Corn	Oats	Barley	Sorghum Grain
	1000 bu.	1000 bu.	1000 bu.	1000 bu.
1951	2,628,937	1,277,647	257,213	162,863
1952	2,980,793	1,217,433	228,168	90,741
1953	2,881,801	1,153,205	246,723	115,719
1954	2,707,913	1,409,601	379,254	235,295
1955	2,883,682	1,503,074	401,225	242,526
1956	3,090,016	1,163,160	376,873	206,205
1957	3,072,913	1,300,954	437,170	564,324
1958	3,441,528	1,415,570	475,196	610,376
1959	3,909,414	1,066,370	422,073	585,253
1960 ^{a/}	3,948,608	1,161,512	423,136	637,673

* Source: United States Department of Agriculture, Grain and Feed Statistics, Supplement for 1960 to Statistical Bulletin No. 159, Agricultural Marketing Service, Washington, D. C., March, 1961.

^{a/} Preliminary

Acres of barley and grain sorghums have increased significantly, while acres devoted to corn have been maintained and those used for oats production have decreased.^{12/}

It appears that feed grain production in the United States in 1975 will equal or exceed requirements as projected by Rogers and Barton.^{13/}

^{12/} United States Department of Agriculture, Grain and Feed Statistics, Supplement for 1960 to Statistical Bulletin No. 159, Agricultural Marketing Service, Washington, D. C., March 1961.

^{13/} Robert O. Rogers and Glen T. Barton, Our Farm Production Potential, 1975, Agricultural Information Bulletin No. 233, Agricultural Research Service, United States Department of Agriculture, Washington, D. C., 1960.

Record yields of feed grains in 1958-59 were almost equal to 1975 requirements, and if farmers increase the rate of adoption of known but unused technology, yields and output will rise up to or beyond expected levels.

In the immediate future, production of feed grains may be restricted by control programs which will be a part of national agricultural policy. Recent developments make the prospects for such programs hard to predict.

An accurate measure of past feeder cattle production was not readily available. Disposition of the annual calf crop is not exactly known, and the management of feeder cattle varied somewhat in each production year. However, data were available relative to the size and composition of the nation's cow herd; the size of past calf crops is approximately known; and some information concerning utilization of calves is available. It was possible to construct an estimate of the availability of feeder calves over the past ten years.

In Table II, data concerning the size of the total cow herd, its composition, and the size of the calf crops are shown.

Changes in the size and composition of the total cow herd directly affected the annual calf crop. As the beef cow herd increased in the early 1950's, the annual output of calves increased by about the same amount. As the dairy cow herd decreased in size in the late 1950's, the production of calves dropped by about 75 percent of the decrease. It appears that the increased proportion of beef cows in the total cow

herd led to some increase in calf output per hundred cows, so the change in composition of the total herd was important to calf production.

TABLE II. COWS 2 YEARS OLD AND OLDER ON FARMS, AND CALF CROPS, UNITED STATES, 1951-1960.*

Year	All Cows	Cows Kept For Milk	Other Cows	Percent Other Cows	Calf Crop
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
1951	42,094	23,568	18,526	44	35,825
1952	43,923	23,060	20,863	47	38,273
1953	46,840	23,549	23,291	50	41,261
1954	48,946	23,896	25,050	51	42,601
1955	49,121	23,462	25,659	52	42,112
1956	48,283	22,912	25,371	52	41,376
1957	46,859	22,325	24,534	52	39,905
1958	45,430	21,265	24,165	53	38,860
1959	45,244	20,132	25,112	55	38,938
1960	45,871	19,527	26,344	57	39,280

* Source: United States Department of Agriculture, Livestock and Meat Statistics, and Livestock and Poultry Inventory, Statistical Bulletins No. 230 and 278, Agricultural Marketing Service, Washington, D. C., 1960.

Data relative to the disposition of the calf crops are shown in Table III. They reveal some changes in use which have increased the number of cattle available for feeding.

Of the net calves available, a decreasing number was utilized as replacements for dairy cows; an increasing number was used as replacements and increase for beef cattle; and a decreasing number was slaughtered commercially and on the farm. The result was a steady increase in numbers available for feeding.

TABLE III. FEEDER CATTLE PRODUCED, UNITED STATES, 1951-60.*

Item	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.	1,000 hd.
1. Calves born preceding year	34,899	35,825	38,273	41,261	42,601	42,112	41,376	39,905	38,860	38,938
2. Calf deaths preceding year	2,297	2,326	2,431	2,487	2,489	2,462	2,425	2,355	2,298	2,375
3. Net calves available	32,602	33,499	35,842	38,774	40,112	39,650	38,951	37,550	36,562	36,563
4. Heifer calves for diary replacements	5,719	5,974	6,029	5,786	5,480	5,267	5,126	5,050	5,079	5,034
5. Heifer calves for beef replacements	5,971	6,535	6,150	6,514	6,238	5,926	5,903	6,557	7,036	7,018
6. Calves kept for bulls (25% bulls Jan. 1)	422	443	447	474	457	438	423	404	396	414
7. Farm calf slaughter during year	484	494	532	524	487	487	449	423	389	386
8. Commercial calf slaughter during year	8,418	8,894	11,668	12,746	12,377	12,510	11,902	9,314	7,679	8,223
9. Deaths during year (2% net calves)	652	670	717	775	802	790	778	748	731	731
10. Total other uses	21,666	23,010	25,573	26,819	25,841	25,418	24,581	22,496	21,310	21,806
11. Total cattle available for feeding (under 2 yrs. old)	10,936	10,489	10,269	11,955	14,271	14,232	14,370	15,054	15,252	14,757

* Source: United States Department of Agriculture, Meat Animals and Livestock and Poultry Inventory, Statistical Bulletins No. 284 and 278, Agricultural Marketing Service, Washington, D. C., 1960.

Changes in the size and composition of the cow herd and the disposition of feeder cattle produced do not tell the whole story about beef production. Of great importance was the increased production per head of cattle from which the beef supply was obtained. In the period 1951-60, total live weight of cattle and calf production increased by 25 percent. In the same time, the total number of cattle and calves on farms January 1 increased by only 17 percent.^{14/} Gains in productivity have been more important than increases in cattle numbers as a source of larger beef and veal supplies.

Factors that contributed to increased productivity include (1) more calves raised to maturity, (2) less death loss, (3) changes in the cattle inventory, (4) more calves born per 100 cows, and (5) higher slaughter weights.

In recent years, calf slaughter has declined. In 1960 only 25 percent of all cattle and calves slaughtered were calves, while in 1951 calf slaughter was 36 percent of the total. Reductions in calf slaughter have increased the average weight of all cattle slaughtered.^{15/}

While some reduction in death loss for calves has occurred since 1950, the big reduction occurred in previous years. Today, almost 20 percent fewer cattle and calves are lost than in the 1920's.^{16/}

^{14/} United States Department of Agriculture, Livestock and Meat Situation, Economic Research Service, LMS-117, Washington, D. C., 1960.

^{15/} See Table III.

^{16/} United States Department of Agriculture, Livestock and Meat Statistics, Statistical Bulletin No. 230, Agricultural Marketing Service, Washington, D. C., 1960.

The number of beef cattle in the total cattle inventory has increased steadily, and about 69 percent of all cattle and calves are now beef cattle. In the beef cattle inventory, beef cows now account for about 40 percent of all beef cattle and calves, compared with about 32 percent in the 1920's. This has been a result of feeding more cattle, slaughtering steers and heifers at an earlier age, and improvements in breeding and management practices.

The number of calves born per 100 cows and heifers two years old and older climbed to 88 in 1953 and has exceeded 85 since 1950. With an increasingly large cow herd, a high birth rate has added many calves to annual inventories.

Average slaughter weights of cattle have made long term increases over the past 40 years. The average dressed weight of cattle has been over 500 pounds since 1949 compared to 468 pounds in 1920. The peak of 572 pounds was reached in 1959. Increased slaughter weights have obviously been important to increased supplies of beef.

In the future, feeder cattle production is likely to be increased by (1) further increases in the numbers of beef cows, and (2) some increase in production of calves. Calving rates should reach 90 percent as improved breeding and handling practices are adopted. This will result in greater numbers of cattle available for feeding. The trend toward raising a greater percentage of calves to maturity and toward feeding more animals in the inventory before slaughter can be expected to continue, and these practices will increase the supply of beef.

The methods and technology used in cattle feeding have changed considerably in the past decade too. These changes have permitted farmers to handle more cattle and to achieve higher levels of production per animal. They have caused some important changes in many beef feeding operations and have contributed to the increased supplies of beef.

Mechanization of many feeding operations has reduced labor requirements and increased output per man hour. Greater numbers of cattle have been fed in lots where mechanical equipment has been installed, and greater precision in feeding has been possible.

A great amount of work has been done with feeds and rations too. New uses of feeds have been developed, and new feeds and feed additives have been discovered. New methods of formulating rations have been important. A completely balanced ration in the form of a pellet or wafer has been developed and has been quite popular where it has been available. These achievements have increased the efficiency of feed conversion and produced more pounds of beef per 100 pound of feed.

Further developments in methods and technology such as those described can be expected for the future. The efficiency of feed conversion will be increased through improved rations and better nutrition; methods for processing and handling feeds will be improved; and facilities for feeding and handling livestock will be expanded and improved.

A factor which has had important effects on cattle feeding and on supplies of beef is specification buying by packers and processors of beef. These specifications are a consequence of consumers' demands for lean tender meat and of retailers' needs for regular supplies of high quality carcasses. They have required that cattle feeders produce fed cattle on a continuing basis, in large volume, and of a high and uniform quality.

These conditions have certainly influenced the management of the total cattle inventory. It has been necessary that feeder cattle be made available at all times during the year so that they could be fattened and marketed according to packer requirements. In addition, the methods and techniques used in cattle feeding have had to be adjusted so that the products of the feeding process, the fed cattle, would meet grade and weight specifications. Trends toward early maturity and feeding of a greater proportion of cattle slaughtered are the result of changes in management.

In the future, specifications are likely to be even more important to production of fed cattle. They will require that close attention be given to cattle and to feeding practices, so that the final product will meet market demand.

The supply of beef in the next 15 years must increase if the demands of an increasing population are to be met. Prospects are that adequate supplies will be produced, but some further adjustment in feed and cattle production will be made. Cattle feeders will have to be

constantly alert to changes in demand and market specifications. They will have to adjust production so as to make the best use of their resources and to maximize returns to their enterprises.

Because of the expected strong demand for beef, it should be safe to say that prospects for profitable cattle feeding operations do exist. The interest in feeding in the Northern Great Plains is well founded. However, further analysis of the situation in this region is needed to determine the real potential for development. The competitive position of livestock feeders needs to be examined, and the effects of an expansion of feeding must be determined. The balance of this report is devoted to an analysis of the topic.

The Beef Cattle Industry--A Framework for Analysis

The analysis of the prospects for and potential of cattle feeding in the Northern Great Plains is best conducted within the framework of the whole beef cattle industry.^{17/} The region does not exist as an isolated area separate from other regions where cattle and feed are produced. It is an integral part of the industry. To achieve perspective and to identify circumstances surrounding production and marketing of cattle in the Northern Great Plains and in the United States, a brief description of the beef cattle industry is essential.

For the purpose of this description the United States was divided into seven regions, as shown in Figure 1.

^{17/} The beef cattle industry is defined here as an industry composed of many producing and marketing units and performing functions necessary to the creation of the end product, meat.

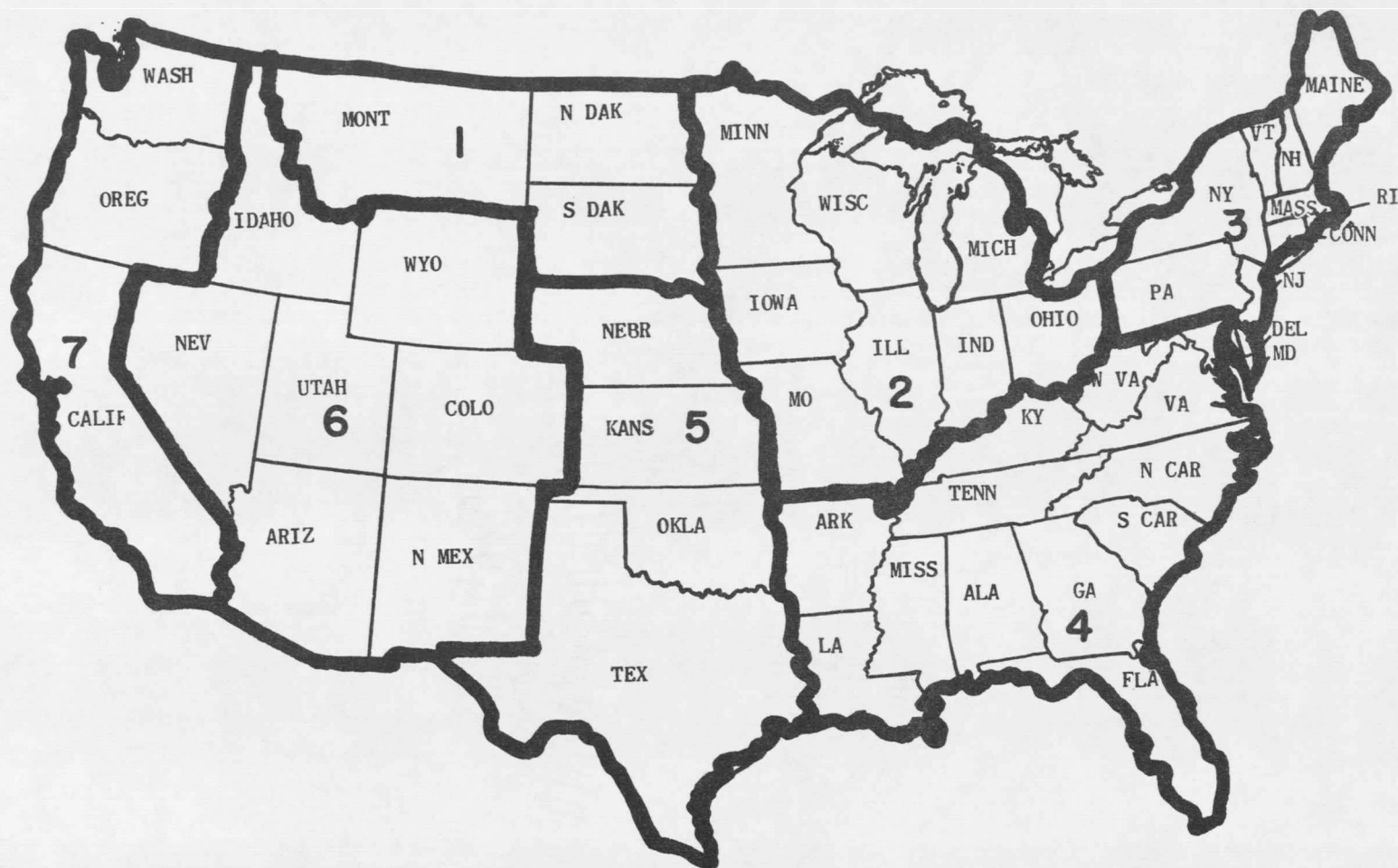


Figure 1. Regions of the United States to be Used in the Description of the Beef Cattle Industry

Region 1 is the study area, the Northern Great Plains. Regions 2 to 7 represent other important areas of production or consumption of beef cattle. Within each region, physical factors such as climate and topography are fairly homogenous. Agriculture in each region is generally rather unique to it, depending on the physical environment and other conditions, and in all regions cattle are produced and marketed. Regions 2, 3, 4, and 7 are the more heavily populated areas where beef consumption is important, and some fairly distinct food consumption patterns are found in each of them. It is believed that this regional breakdown is appropriate to the description of the beef cattle industry.

Production of Feeder Cattle

The production of beef may be said to start with the production of cattle which are born and raised on farms and ranches in all of the 48 contiguous states. In the West, where most of our hay and pasture land is located, we find the large ranches and the big beef cow herds. In the East, we find the large dairy herds from which come many cattle to be utilized in beef production. In the South, there is a rapidly developing livestock economy which is producing increasing numbers of beef animals. To properly describe the production of cattle in the seven regions of the United States, data on production were assembled and appear in Table IV.

TABLE IV. FEEDER CATTLE PRODUCED IN 7 REGIONS, UNITED STATES, 1956-60.*

Year	Cattle Available for Feeding <u>a/</u>	Year	Cattle Available for Feeding <u>a/</u>
	1000 hd.		1000 hd.
Region 1		Region 5	
1956	2382	1956	4860
1957	2348	1957	4717
1958	2242	1958	3998
1959	2296	1959	3917
1960	2304	1960	4019
Region 2		Region 6	
1956	2117	1956	1864
1957	2302	1957	1827
1958	2834	1958	1713
1959	2961	1959	1730
1960	2795	1960	1754
Region 3		Region 7	
1956	823	1956	590
1957	754	1957	608
1958	475	1958	819
1959	431	1959	818
1960	595	1960	906
Region 4		United States	
1956	3242	1956	14,232
1957	3322	1957	14,370
1958	3923	1958	15,054
1959	3961	1959	15,252
1960	3574	1960	14,757

* Source: United States Department of Agriculture, Meat Animals and Livestock and Poultry Inventory, Statistical Bulletins No. 284 and 278, Agricultural Marketing Service, Washington, D. C., 1960.

a/ Calculated as in Table III.

Examination of the data indicates that Region 5, which includes Nebraska, Kansas, Oklahoma, and Texas, produced the greatest number of feeder cattle in each of the five years. In 1960, over four million head were produced, and this amounted to about 27 percent of all such cattle produced in the United States. Region 4 ranked second in production of feeder cattle in 1960, with an output of about 3.5 million head. About 24 percent of the total in the United States were produced here. Region 2 ranked third in feeder cattle production in 1960. Almost 2.8 million head were made available for feeding. The Northern Great Plains, Region 1, ranked fourth in feeder production in 1960 close behind Region 2. In Montana, North Dakota and South Dakota, 2.3 million head of cattle were available for feeding, about 16 percent of the total feeders in the United States. Region 6, composed of the inter-mountain states, produced 1.7 million feeder calves in 1960, about 12 percent of all feeder cattle produced. Region 7, which includes the western coastal states, produced a small but increasing number of feeder cattle in the 1956-60 period. Numbers produced were increased from 590 to 906 thousand head. This is not a significant part of total feeder production but it has been quite important to these states. Region 3 was found to be different from the other regions in that fewer cattle were produced than were utilized. About 90 percent of the number of net calves were slaughtered in the region annually. With the requirements for replacements and increase, it was necessary that calves be imported for veal.

The data in Table IV has served to identify important areas of feeder cattle production and to describe production in quantitative terms. The estimates of cattle available for feeding will be useful in analyzing potential developments in cattle feeding.

Marketing of Feeder Cattle

Many cattle and calves are fed off the farms where they are produced. For this description of the beef cattle industry it is important to note the markets employed in achieving the transfer from farm and ranch to feedlot and the movements of feeder cattle.

Data in Table V are indicative of the importance of various market outlets.

Auctions were most important in 1955, with 43 percent of all calves sold in the United States going through this kind of market. Auctions were quite popular in the Northeast and South and less important in the West. Terminal public markets handled over 21 percent of all calves sold, and these outlets were most employed in the North Central area. Country sales involving dealers and farmers were direct sales, involving no market agency, and accounted for 32 percent of all calves sold. This method of disposition was most important in the West. A small percent of calves went to packers to be slaughtered as veal.

Movements of feeder cattle from areas where they were produced to areas where they were fed were difficult to trace. Reporting of sales

TABLE V. PERCENT OF CALVES SOLD THROUGH DIFFERENT MARKET OUTLETS, BY GEOGRAPHIC REGIONS, 1955*

Kind of Livestock and Region	Percentage Sold through Market Outlets						
	Number Marketed	Terminal Public Markets	Auctions	Direct to Packers	Country Sales		All Others
					Local Dealers	Farmers	
	1000 hd.	percent	percent	percent	percent	percent	percent
Calves Under 1 Year:							
Northeast	1,915	13.4	48.1	5.2	25.6	5.6	2.1
North Central	6,989	29.8	39.6	8.3	13.9	7.3	1.1
South	6,720	19.0	53.9	5.4	8.9	10.4	2.4
West	2,765	13.2	21.7	12.3	20.4	19.9	12.5
United States	18,389	21.6	43.0	7.5	14.3	10.2	3.4

* Source: United States Department of Agriculture, Market Outlets for Livestock Producers, Market Research Report No. 216, Agricultural Marketing Service, Washington, D. C., 1956.

and shipments of cattle varied from state to state, and the kinds and amounts of data varied considerable too. Table VI is representative of the reports that are made of feeder cattle shipments, and data are indicative of general movements.^{18/}

Shipments of stockers and feeders out of public stock yards in Regions 2 and 5 were quite important in the period 1956-60. They accounted for 55 percent of all 1960 shipments from stockyards. In these regions are located some of the principal areas of production of cattle and all the major public terminal markets for stockers and feeders except Denver. Kansas City is the most important market in terms of stockers and feeders. Sioux City, Omaha, Oklahoma City, Fort Worth, and San Antonio also ship large numbers of cattle.

The public stockyards in Sioux Falls is of moderate size and is much the same kind of market as those in Region 2. Many feeder cattle produced in Region 1 are marketed in Sioux Falls, St. Paul, and Sioux City.

The stockyards in Region 6 serve the intermountain states and handle as many as a half million stockers and feeders. The increasing popularity of direct selling has made these markets less important.

Other stockyards in Regions 3, 4, and 7 shipped small numbers of cattle and were not important.

Of the total number of stockers and feeders shipped from these

^{18/} See also Tables IV and V in Appendix.

TABLE VI. INSPECTED STOCKER AND FEEDER SHIPMENTS OF CATTLE AND CALVES
FROM PUBLIC STOCKYARDS, 1956-60.*

Origin	1956	1957	1958	1959	1960
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	100 hd.
Region 1					
Sioux Falls	117	111	125	113	133
Region 2					
Chicago	97	70	68	63	49
Cincinnati	13	13	16	18	16
Detroit	28	17	11	9	8
Indianapolis	64	45	48	52	59
Kansas City	608	444	456	477	441
St. Louis	144	134	130	148	135
Sioux City	459	508	577	586	489
S. St. Joseph	124	125	140	154	156
St. Paul	143	138	138	139	130
Total	1,684	1,499	1,588	1,651	1,487
Region 3					
Lancaster	92	84	105	117	117
Region 4					
Baltimore	26	24	21	34	31
Louisville	55	58	73	78	87
Nashville	22	36	63	63	56
Total	104	119	157	177	174
Region 5					
Omaha	433	360	413	427	359
Wichita	125	112	127	128	119
Oklahoma City	398	324	304	403	391
Fort Worth	292	213	268	286	371
San Antonio	302	203	218	263	249
Total	1,552	1,214	1,332	1,508	1,491
Region 6					
Clovis	81	31	25	31	75
Denver	307	264	277	300	258
Ogden	188	116	109	96	100
Total	577	412	412	428	434
Region 7					
Los Angeles	80	46	37	50	9
All Other Inspected	982	1,665	1,696	1,609	1,539
Total	5,192	5,154	5,455	5,656	5,387

* See asterisk on next page.

TABLE VI. INSPECTED STOCKER AND FEEDER SHIPMENTS OF CATTLE AND CALVES FROM PUBLIC STOCKYARDS, 1956-60.* (Continued)

Destination	1956	1957	1958	1959	1960
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1					
South Dakota	88	104	117	107	99
Region 2					
Ohio	146	97	88	91	81
Indiana	205	153	135	139	150
Illinois	534	414	390	438	391
Michigan	78	59	39	44	48
Wisconsin	20	18	17	18	20
Minnesota	162	153	170	191	191
Iowa	891	883	1,034	1,111	971
Missouri	309	324	294	337	356
Total	2,349	2,104	2,171	2,373	2,212
Region 3					
Pennsylvania	121	112	133	148	141
Region 4					
Maryland	20	21	19	27	25
Virginia	12	11	7	6	3
Kentucky	53	40	36	41	40
Tennessee	40	35	44	45	47
Total	127	109	108	120	116
Region 5					
Nebraska	343	395	467	472	393
Kansas	240	395	431	393	407
Oklahoma	200	223	239	216	219
Texas	425	395	485	527	496
Total	1,209	1,409	1,623	1,608	1,516
Region 6					
Colorado	220	174	192	197	162
Utah	43	39	44	40	47
Total	263	214	236	237	209
Region 7					
California	475	296	275	278	336
All Other Inspected	557	802	789	782	755
Total	5,192	5,154	5,455	5,656	5,287

* Source: United States Department of Agriculture, Livestock and Meat Statistics, Statistical Bulletin No. 230, Agricultural Marketing Service, Washington, D. C., 1960.

public stockyards in 1960, 69 percent were consigned to states in Regions 2 and 5. The total number of feeders shipped to Regions 2 and 5 exceeded the shipments from stockyards in those regions so there was obviously a movement of feeder cattle into them.

Shipments to California from these public stockyards far exceeded the numbers handled by the Los Angeles yard. A distinct westward movement of feeder cattle is evident.

Shipments of stockers and feeders from stockyards in Regions 1, 4, and 6 exceeded the numbers consigned to states in these regions, and feeders shipped from "all other inspected" stockyards were double the consignment to other states.

These and other data on movements of feeder cattle can be pictured by a flow diagram which shows in a general way the direction of movement of cattle from areas of production to areas where cattle are fed. It is shown in Figure 2. It is useful as a pictorial representation of a marketing process important to cattle feeding.

Production of Feed Grains

An important aspect of cattle feeding is feed production and marketing. Feedlot conditioning and fattening depends upon adequate supplies of the feed grains, so it is important to know where these grains were produced, how they were marketed, and where they were used.

Table VII shows production of the four feed grains by region for the 1956-60 period.

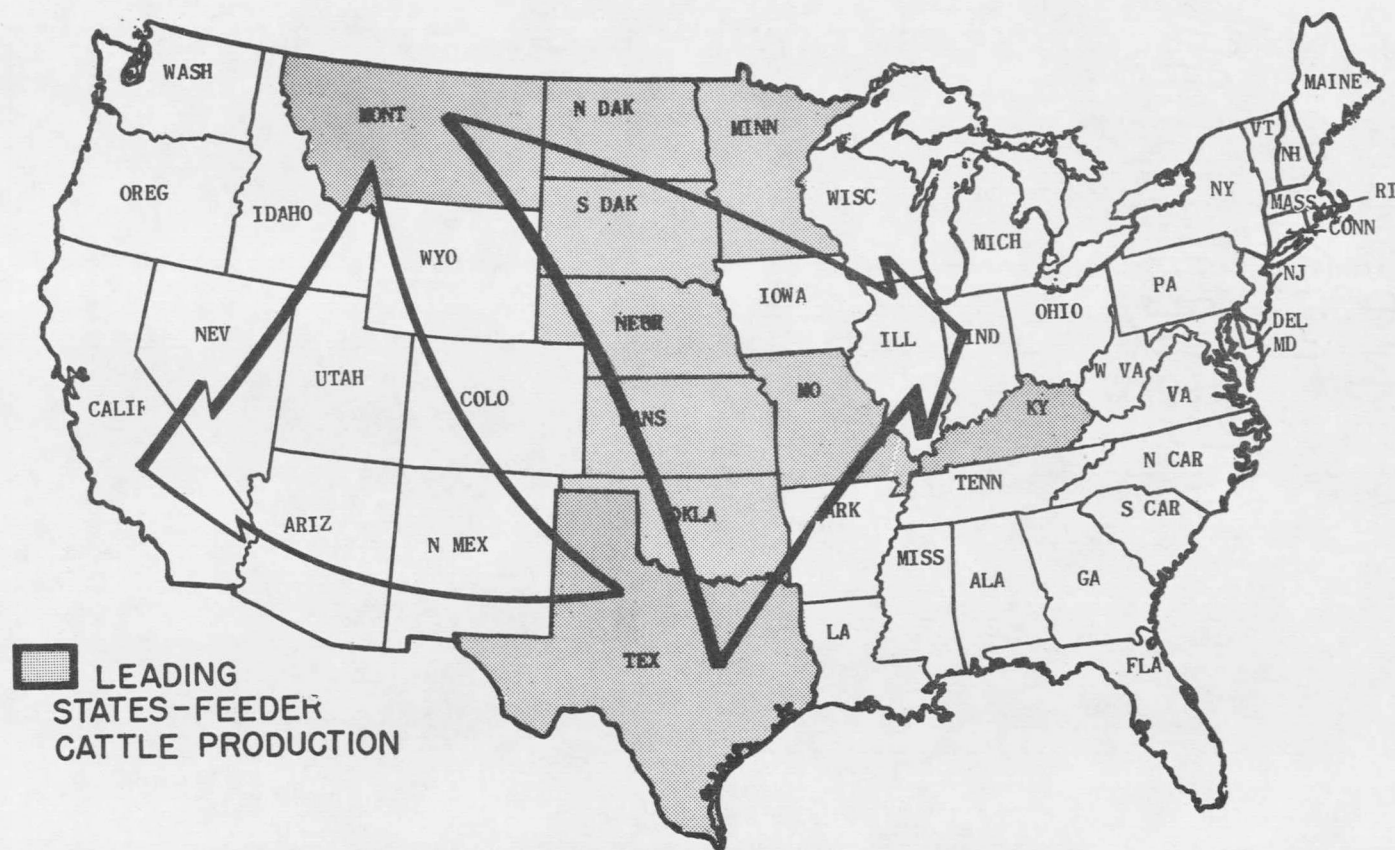


Figure 2: General Direction of Flow of Feeder Cattle from Areas of Production to Areas Where Cattle are Fed

TABLE VII. FEED GRAIN PRODUCTION, 7 REGIONS, UNITED STATES, 1956-60.*

	Corn	Oats	Barley	Grain
	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.
Region 1				
1956	106	101	111	1
1957	136	178	132	6
1958	101	206	173	5
1959	66	88	133	3
1960	126	183	135	6
Region 2				
1956	2,242	771	57	9
1957	2,138	786	43	41
1958	2,294	904	54	50
1959	2,749	711	45	30
1960	2,737	722	45	28
Region 3				
1956	77	59	11	---
1957	54	71	11	---
1958	85	68	12	---
1959	84	69	6	---
1960	83	62	9	---
Region 4				
1956	490	117	20	7
1957	403	86	16	13
1958	531	61	15	15
1959	529	72	16	10
1960	525	56	17	9

* See asterisk on next page.

TABLE VII. FEED GRAIN PRODUCTION, 7 REGIONS, UNITED STATES, 1956-60.*
(Continued)

	Corn	Oats	Barley	Grain
	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.
Region 5				
1956	148	70	18	167
1957	294	135	34	459
1958	389	136	49	502
1959	440	87	49	499
1960	442	100	49	553
Region 6				
1956	11	17	45	10
1957	17	21	63	26
1958	20	20	55	25
1959	19	17	55	23
1960	16	16	56	22
Region 7				
1956	13	24	111	9
1957	15	28	132	12
1958	17	23	109	15
1959	19	20	114	18
1960	17	18	108	17
United States				
1956	3,090	1,163	376	206
1957	3,060	1,308	435	561
1958	3,441	1,422	470	614
1959	3,909	1,066	422	585
1960	3,948	1,161	423	637

* Source: United States Department of Agriculture, Crop Production,
Agricultural Marketing Service, Cr Pr 2-1, Washington,
D. C., 1960.

Region 2 was the leader in feed grain production. Total output of all feed grains has exceeded three billion bushels since 1956 and amounted to more than 3.5 billion bushels in 1959-60. This was more than one-half of all feed grains produced in the United States. The region is an important producer of livestock feeds.

Region 5 ranked second in output of feed grains. In this region approximately 1.1 billion bushels of corn, oats, barley, and grain sorghum were produced in 1960. This was about 18 percent of the total output of the United States. An important aspect of production in this region has been the great increases in output of corn, barley, and grain sorghums in the past five years.

Region 4 ranks third in feed grain production. The southeastern states produced about 609 million bushels of the four feed grains in 1960. Corn was the most important grain in this area, but the output of grain sorghums was increasing from 1956-60. Total output was almost ten-percent of that produced in the United States.

Region 1, the Northern Great Plains, produced approximately 450 million bushels of corn, oats, barley, and grain sorghums in 1960. This was about seven percent of total production in the United States. Oats were produced in the greatest volume in the 1956-60 period, with barley and corn following closely in terms of total output. Grain sorghums were relatively unimportant. In the five-year period output of each of the grains fluctuated widely, and total production for the region varied from 487 million bushels in 1958 to 291 million bushels

in 1959. Variations in annual output have been characteristic of Region 1 and probably must be expected in future years.

The remaining regions produced relatively small portion of feed grains in the United States.

Disposition of Feed Grains

Because of the concentration of feed grain production in the midwest, disposition of the total annual supplies is of interest. Table VIII shows feed grain disposition for the seven regions in terms of farm use and sales.^{19/}

The data show that in Region 2 about 57 percent of the 1960 corn crop was used (feed, seed and home use) on farms where produced. In addition, some 73 percent of the oats, 44 percent of the barley and 53 percent of the grain sorghums produced in 1960 were used on the farms where produced. Region 2 not only produced a large part of all feed grains, but a significant percentage of production was fed where produced.

Region 5, second in production of feed grains, used 39 percent of 1960 output on the farms where it was produced. About 49 percent of the corn and 23 percent of the grain sorghums produced were used on farms. It appears that large quantities of grain sorghums were sold in the region to be used elsewhere or stored.

In Region 4, the southeastern region, almost 69 percent of all

^{19/}

See also Table VI and VII in Appendix for further data on disposition.

TABLE VIII. FEED GRAIN DISPOSITION, 7 REGIONS, UNITED STATES, 1956-60.*

	Corn ^{a/}		Oats		Barley		Grain Sorghums		Feed Grains		
	Used on Farms	Sold	Used on Farms	Sold	Used on Farms	Sold	Used on Farms	Sold	Total	Farm	Sales
	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced	Where Produced
	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.
Region 1											
1956	99	40	71	29	29	81	1	-----	355	202	153
1957	119	48	119	59	36	96	3	3	486	278	208
1958	97	36	139	67	38	135	3	2	518	277	241
1959	84	21	61	26	36	97	1	1	329	182	146
1960	121	46	123	59	41	94	3	2	494	290	203
Region 2											
1956	1,468	955	586	184	27	30	5	4	3,262	2,087	1,174
1957	1,500	813	608	177	22	21	27	14	3,186	2,159	1,026
1958	1,596	891	682	221	22	32	28	22	3,497	2,329	1,168
1959	1,726	1,209	539	172	18	26	17	13	3,722	2,301	1,421
1960	1,690	1,250	525	197	19	25	14	13	3,736	2,250	1,486
Region 3											
1956	96	27	48	10	9	2	-----	-----	196	154	41
1957	88	12	59	11	8	2	-----	-----	183	156	26
1958	102	31	56	11	9	3	-----	-----	215	168	46
1959	99	31	57	11	4	1	-----	-----	206	161	45
1960	100	32	53	9	6	2	-----	-----	205	161	43
Region 4											
1956	393	142	67	49	15	4	4	2	679	480	199
1957	343	104	51	34	12	4	7	6	565	415	149
1958	420	155	41	20	12	3	8	6	668	483	185
1959	411	166	45	26	13	3	6	3	677	476	201
1960	400	176	35	21	12	4	6	3	660	454	205
Region 5											
1956	112	68	51	19	12	6	33	133	438	210	228
1957	158	152	98	37	21	13	95	364	942	374	568
1958	207	196	96	40	25	23	111	390	1,093	441	652
1959	226	236	63	24	27	21	126	373	1,099	444	655
1960	229	239	68	32	25	24	129	424	1,173	453	720
Region 6											
1956	22	5	10	7	18	26	2	7	101	54	46
1957	27	9	12	9	24	38	6	20	148	71	77
1958	28	10	12	8	24	30	6	19	139	71	68
1959	30	9	11	6	22	32	6	16	136	70	65
1960	30	7	10	6	25	31	6	15	133	72	60
Region 7											
1956	9	11	10	14	16	94	1	8	167	38	129
1957	9	13	8	19	19	113	1	10	195	39	156
1958	9	14	8	14	15	94	2	13	172	35	137
1959	12	16	7	12	15	99	2	15	182	37	145
1960	12	14	7	11	15	93	2	15	171	36	134
United States											
1956	2,203	1,251	846	316	129	247	49	157	5,201	3,246	1,972
1957	2,247	1,155	959	348	145	290	142	419	5,708	3,495	2,213
1958	2,462	1,337	1,037	384	147	322	159	455	6,307	3,087	2,499
1959	2,589	1,692	785	281	138	283	161	423	6,355	3,674	2,680
1960	2,586	1,766	824	337	146	276	163	474	6,574	3,719	2,855

* Source: United States Department of Agriculture, Field and Seed Crops, Agricultural Marketing Service, Cr Pr 1 (58), Washington, D. C., 1958.

^{a/} Includes grain equivalent of corn silage and forage as well as grain corn.

feed grains were used on the farms where produced. While the farms in the region did not produce a very large part of the total feed grains, production was utilized to a great extent at home.

In Region 1, about 59 percent of the 1960 output of all feed grains was used on the farms where produced. About 72 percent of the corn was used at home, while 67 percent of the oats and 30 percent of the barley was utilized on farms where produced. A large part of the barley output was sold for storage or use off the farms where produced.

Regions 7, 3, and 6 did not contribute a great deal to the supply of feed grains, and about one-half of the production did not leave the farms where it originated. In Region 7, 22 percent of feed grain output was used where produced; in Region 3, 79 percent of output was used at home; and in Region 6, 54 percent of the feed grains produced were used on the farms where they originated. It appears that livestock feeding is important on grain producing farms in Regions 3 and 6 but not in Region 7.

As in the case with cattle movements, information concerning the movements of feed grains is limited. But at least one study of grain transportation in the north central states is useful to this description of the beef cattle industry, and statistics provided by the Interstate Commerce Commission on rail movements of feed grains are revealing.^{20/}

^{20/} See Tables VIII and IX in Appendix.

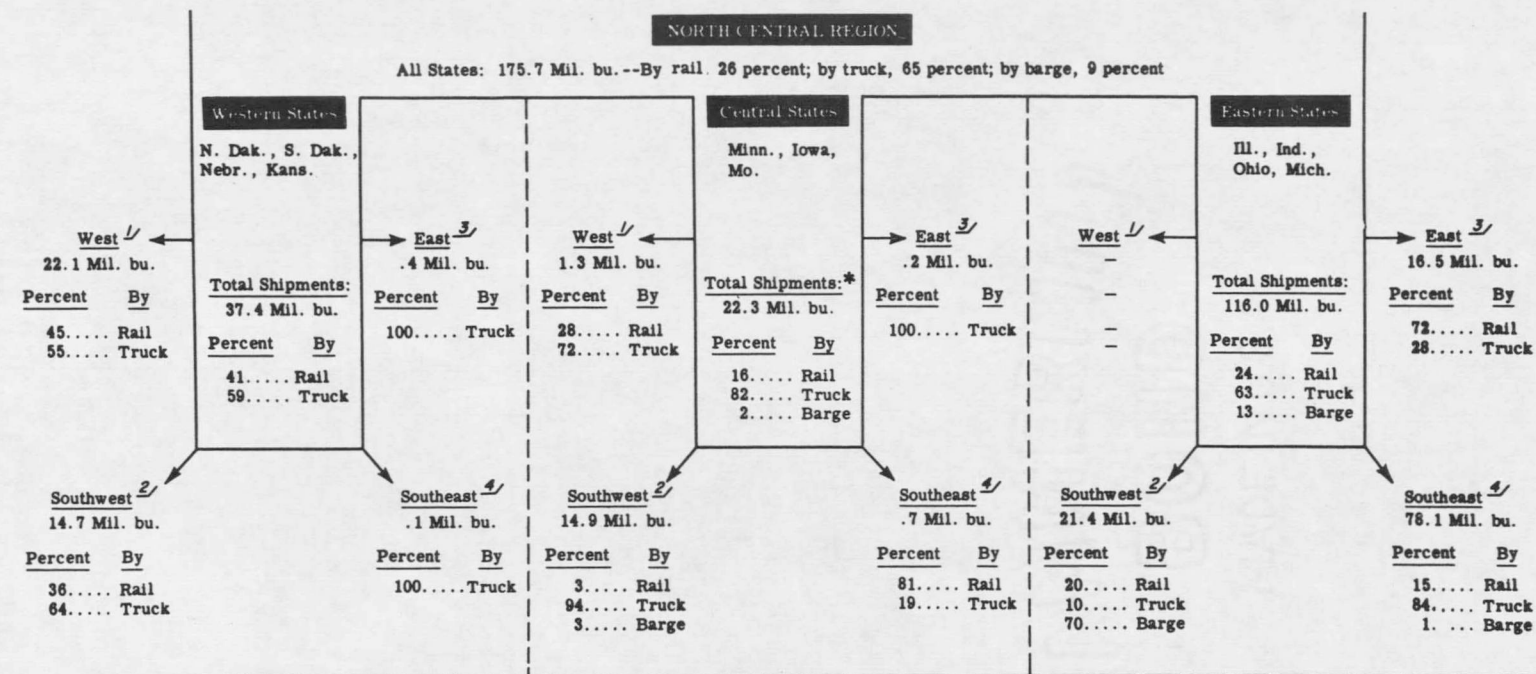
Economists in the United States Department of Agriculture recently completed a study of grain transportation in an area which included North Dakota, South Dakota, Kansas, Minnesota, Nebraska Iowa, Missouri, Michigan, Illinois, Ohio, and Indiana. These are states included in Regions 1, 2, and 5. This is an area which has been described in this report as very important in the production of feed grains. So the data contained in the study of grain movements is relevant.

These researchers found that the bulk of the grain sold by farmers in this area was moved to country elevators. At these elevators, the grain was stored and eventually merchandised. Shipments from these elevators included consignments to terminal facilities, processors, feeders, and exporters both within the area and outside of it. During 1958, 2.4 billion bushels of grain were shipped to various destinations.

Of the 2.4 billion bushels of grain shipped by all country elevators, 289 million bushels were local sales, 315 million bushels were government grain, and 1.8 billion bushels were non-government grain shipped within the region. This leaves 242 million bushels of grain of which 175 million bushels were shipped out of the region. The balance was unrecorded shipments.

Figure 3 shows where and how shipments of grain out of the region were made and the quantities of grain moved to identified areas. The mode of transport is also shown in the figure.

Shipments to the West where feed grain production is relatively unimportant were made largely by states in the western part of the



^{1/} West: California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

^{2/} Southwest: Arizona, Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

^{3/} East: All 6 New England States plus Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia.

^{4/} Southeast: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

* Includes 5.2 million bushels moving to points in Wisconsin not included in survey of Grain Transportation in the North Central States. Thirty-eight percent moved by rail and 62 percent by truck.

Figure 3. Interregional Shipment of Non-government Grain by Country Elevators in North Central Region, 1958.

north central area. The principal movements were about 14 million bushels of corn from Nebraska, five million bushels of grain sorghums from Kansas and Nebraska, and about two million bushels of soy beans from Kansas, Nebraska and North Dakota.

Feed grain requirements for the Southwest, beyond those met by production of grain sorghums in that area, were met by imports from the north central area. In 1958, about 51 million bushels of non-government grain moved to this area from country elevators in the north central area. Half of the grain move, 27 million bushels, was corn.

Relatively small amounts of the feed grains were produced in the East, and the area imported heavily from the north central area. The major movement of grain was from terminal elevators, but the volume of non-government grain shipped by country elevators was substantial. Ohio was the leading state in eastern shipment.

While grain production in the Southeast has been expanding in recent years, it has not kept pace with the requirements of the broiler, dairy, and livestock industry. Thus the Southeast draws substantial supplies of feed grain from the north central area, some 79 million bushels in 1958 from country elevators and large volumes of grain from terminals which were shipped by barge.

It is evident that the north central area is an important source of supply of feed grains for areas surrounding it. Feed grains moved from this important producing area in all directions, but principally to the Southeast and Southwest.

The Interstate Commerce Commission data showed that movements of corn out of Regions 2 and 5 amounted to 49 thousand tons and included shipments to Regions 3, 4, 6, and 7. Regions 3 and 4 received 45 thousand tons by rail and Region 6 and 7 received 4 thousand tons. So the bulk of the corn shipments by rail from Regions 2 and 5 appear to have been consigned to eastern and southeastern states.

Grain sorghums were produced largely in Region 5, and it was there that the greatest rail movements occurred. Grain sorghums did move out of Region 5, largely to Regions 2 and 7. It was noted that large quantities of grain sorghums moved by truck, so these data may not be significant.

The bulk of the oats was moved by rail within Region 2, but shipments of 7,363 tons were made to the East and Southeast, Regions 3 and 4. Some shipments of oats were made from Region 1 to Region 2 and within Regions 5 and 7.

Considerable outbound traffic in barley was recorded for Region 1 in 1959. About 18,685 tons went to Region 2, and 4,685 tons went to Region 7. Large quantities also moved within Region 2, with moderate amounts going from there to Regions 3, 4, and 5. In Region 7, there were 9,398 tons of barley moved within the three-state area.

These and other data on feed grain movements seem to be adequate for the development of a flow diagram similar to that for feeder cattle. It is recognized that such a diagram cannot represent actual movements of feed grains with a great deal of accuracy, but it does provide a picture of these movements which may be helpful.

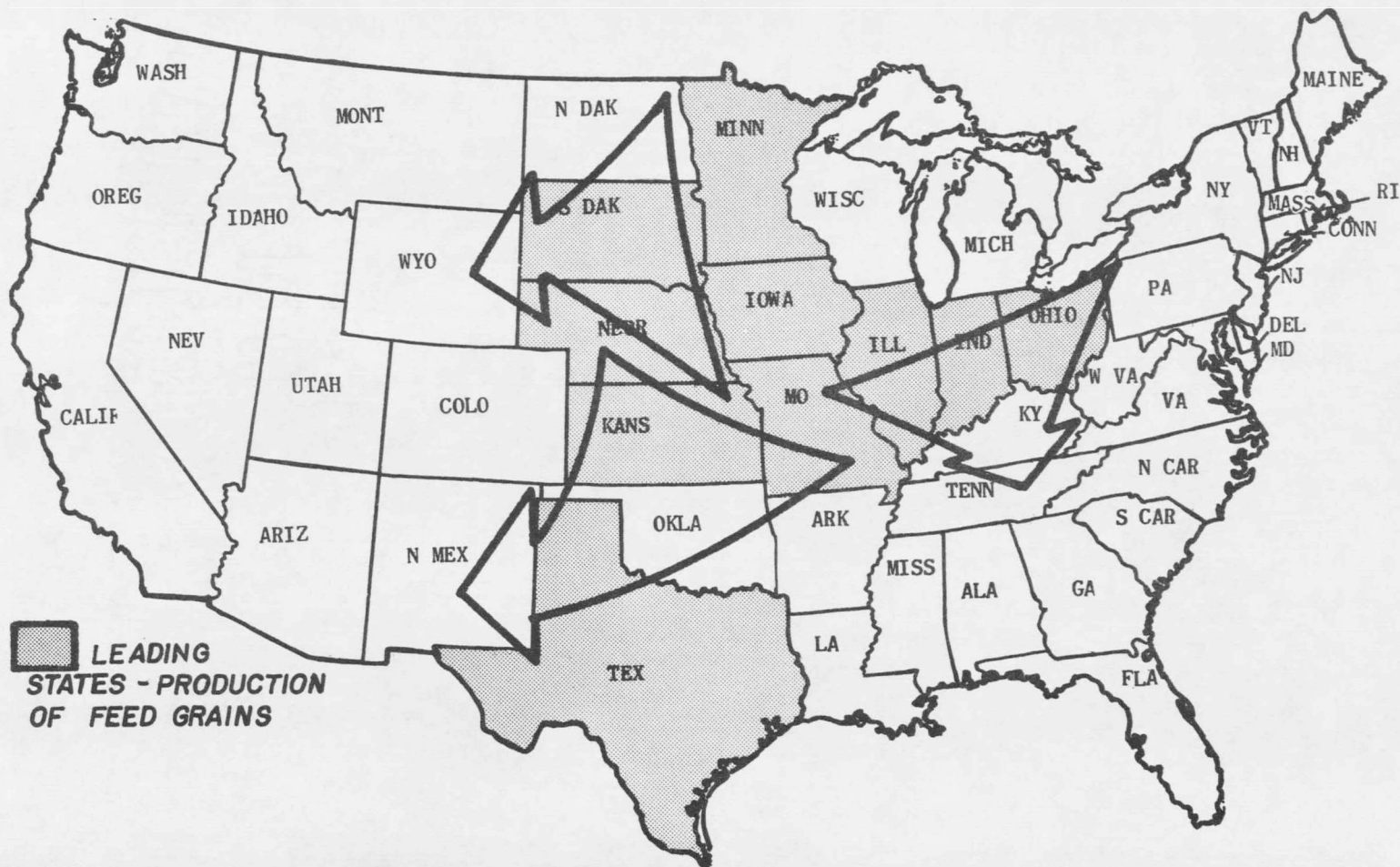


Figure 4: General Direction of Flow of Feed Grains from Areas of Production to Areas Where Utilized

Areas Where Cattle Are Fed

The areas where cattle are fed are described in part by the data in Table VIII. In this table, the number of cattle and calves on feed January 1, placed on feed, and marketed are recorded as the data are available. The data are incomplete because quarterly estimates of cattle on feed were made in only 13 states during the 1955-57 period, 14 states in the year 1958, 21 states in 1959, and 26 states in the final year, 1960. Despite the inadequacy of the data, they are included here, for they are indicative of the importance of cattle in several states and in the regions.

It is obvious that cattle feeding has been important in Region 2. This region has fed and marketed a large proportion of all cattle so handled. In 1960, when most important cattle feeding states were included in the United States Department of Agriculture reports, 45 percent of all cattle reported placed on feed were fed in feedlots in this region.

Region 5 has also been important in cattle feeding. In 1960 about 20 percent of the cattle placed on feed were found in the southern plains states. In recent years the numbers of cattle fed in this region have been increasing significantly.

In Regions 6 and 7, which include the southwestern and coastal states, about equal numbers of cattle were placed on feed in 1960. In each region about 15 percent of the cattle placed on feed in the

TABLE IX. CATTLE AND CALVES ON FEED, JANUARY 1, PLACED ON FEED, BY
QUARTERS, AND MARKETING BY QUARTERS, SELECTED STATES, 5
REGIONS, 1956-60.*

		January 1 Inventory	Placed On Feed During Year	Marketed During Year	December 31 Inventory
		1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1 ^{a/}					
1 State	1956	210	354	329	235
1 State	1957	235	386	355	266
1 State	1958	266	418	415	269
3 States	1959	455	640	653	442
3 States	1960	442	754	655	541
Region 2 ^{a/}					
6 States	1956	2887	5027	4874	3040
6 States	1957	3040	5008	5052	2996
6 States	1958	2996	5361	5183	3174
8 States	1959	3397	5825	5686	3536
8 States	1960	3536	5918	5782	3650
Region 5 ^{a/}					
3 States	1956	883	1958	1964	877
3 States	1957	877	1747	1788	836
4 States	1958	877	2212	2003	1086
4 States	1959	1086	2524	2353	1257
4 States	1960	1257	2642	2570	1351
Region 6 ^{a/}					
2 States	1956	488	988	956	520
2 States	1957	520	929	961	488
2 States	1958	488	1151	1074	565
4 States	1959	767	1563	1462	868
7 States	1960	1009	1859	1803	1065
Region 7 ^{a/}					
1 State	1956	503	1230	1224	509
1 State	1957	509	1125	1229	405
1 State	1958	405	1275	1169	511
1 State	1959	511	1595	1441	665
3 States	1960	846	1973	1932	887

* See asterisk on next page.

^{a/} See next page.

TABLE IX. CATTLE AND CALVES ON FEED, JANUARY 1, PLACED ON FEED, BY
QUARTERS, AND MARKETING BY QUARTERS, SELECTED STATES, 5
REGIONS, 1956-60.* (Continued)

		January 1 Inventory	Placed On Feed During Year	Marketed During Year	December 31 Inventory
		1000 hd.	1000 hd.	1000 hd.	1000 hd.
Totals					
13 States	1956	4971	9557	9347	5181
13 States	1957	5181	9195	9385	4991
14 States	1958	5032	10417	9844	5605
20 States	1959	6216	12147	11595	6768
25 States	1960	7090	13146	12742	7494

* Source: United States Department of Agriculture, Cattle and Calves on Feed, Statistical Bulletin 277, Agricultural Marketing Service, Washington, D. C., 1960.

a/ Selected states include:

	<u>1956-57</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>
Region 1	S. Dak.	S. Dak.	S. Dak. N. Dak. Mont.	S. Dak. N. Dak. Mont.
Region 2	Ohio Ind. Ill. Minn. Iowa Mo.	Ohio Ind. Ill. Minn. Iowa Mo.	Ohio Ind. Ill. Minn. Iowa Mo. Mich. Wisc.	Ohio Ind. Ill. Minn. Iowa Mo. Mich. Wisc.
Region 5	Nebr. Kans. Texas	Nebr. Kans. Texas Okla.	Nebr. Kans. Texas Okla.	Nebr. Kans. Texas Okla.
Region 6	Ariz. Colo.	Ariz. Colo.	Ariz. Colo. Idaho Utah	Ariz. Colo. Idaho Utah N. Mex. Wyo.
Region 7	Cal.	Cal.	Cal.	Cal. Wash. Ore.

26 states were to be found. The increase in cattle feeding in these two regions in recent years is also notable.

Numbers of cattle placed on feed in Region 1 have been relatively small, though they have grown considerably in the last five years. The 1960 total of 754 thousand cattle placed on feed was less than six percent of all cattle reported in the 26 states.

Region 2 must be recognized as a very important cattle feeding area. Feeders in this region draw feeder cattle out of many cattle producing states (and especially from Regions 1 and 5) and they will probably continue to exert great influence on production and feeding activities in the several regions.

Kinds and Characteristics of Feeding Operations

Information about the kinds of feeding operations in the seven regions was not readily available. Some data were obtained from college experiment stations which described the extent of feeding in certain areas. A few popular publications, trade journals, and magazines contained articles which revealed some of the characteristics of feeding enterprises in various states and regions. These materials were reviewed and summarized so that some measure of the scope and character of cattle feeding operations in the seven regions could be developed.

In Region 1, cattle feeding takes place largely on farms. Feeding enterprises are complementary in nature and located on both

crop and livestock producing units. They have served as important outlets for farm produced feeds and cattle, and have utilized underemployed, winter-time farm labor. About 600 farm feedlots were reported in Montana in 1960, and 1,000 lots were reported in North Dakota in that year. These lots varied in size with most of them handling 100-200 head. A few lots have a capacity of 500-1000 head of cattle. Both the number of lots and the average number of head in each lot have been increasing in recent years.

Dry lot feeding has prevailed in the three-state area with the feeding rations dependent on the location of the feedlots. Feeding operations are located both in irrigated valleys, where roughages such as silage and hay are important, and in dryland producing areas, where concentrates are available in large quantities. Corn and barley are the most used feed grains, and corn silage, alfalfa, and other hays are used as roughage. Sugar beet residues and by-products are included in some rations when they are available.

In recent years, commercial feeding operations have been developed in all three states. There are about ten feedlots in Montana with capacities for more than 1,000 head of cattle, and a similar number were reported in South Dakota. But these large feedlots have not handled a very large proportion of the cattle fed in the region.

Farm feeding of cattle is also important in Region 2, the Corn Belt. Feeding enterprises are much more numerous in this region than in any other and have been established for longer periods of time.

Cattle feeding is very important in the Corn Belt because of the great quantities of corn and corn silage produced there. The outlets for these crops have traditionally been livestock, both cattle and hogs, and cattle are imported for feeding from the West and South.

Information from Illinois, Minnesota, and Indiana, provides some insight into the scope of the feeding industry in the region. In Illinois, nearly 7,000 farms marketed more than 50 head of cattle in 1959. More than 800 marketed 200 head, and 26 farms marketed more than 1,000 head of fed cattle. Farm feeding is obviously quite important while large scale commercial feeding has not developed significantly. In Minnesota about 20,000 cattle feeding operations exist, but many of these fed under 50 head. Only about 200 feedlots handled more than 300 head during the year, and a small but undetermined number of lots fed more than 500 head. About 1,800 feed lots were counted in Indiana which fed more than 50 head of cattle per year. Only 23 lots fed more than 500 head annually, so here too farm feedlots prevail. The data for these three states are probably quite representative of feeding operations in Region 2, and it is obvious that farm feedlots are of greatest importance.

Dry lot feeding has prevailed in the Corn Belt just as it has in Region 1. Cattle typically are used to clean up crop residues--corn stubble and other aftermath--and then placed in feedlots. Corn is the principal concentrate used in the rations, with some oats added when available. Corn silage and hay are used as roughages.

Cattle feeding is important in only one state in Region 3--

Pennsylvania. About 80 thousand head of cattle and calves have been on feed there on January 1 in each of the last five years, and numbers on feed have been increasing recently. Most of the feedlots in Pennsylvania are in the 30-50 head class with only 25-30 feeders handling over 200 animals per year. Less than a dozen feedlots have sufficient capacity to feed 400-500 cattle at one time. Most of the larger units have a year-around feeding program, while the smaller ones feed cattle only through the winter. The feeding program has been similar to that typical of the Corn Belt.

In Region 4, the southeast states, cattle feeding has just begun to develop as an important part of the beef cattle industry. Increasing numbers of cattle have been placed on feed in recent years, and the output of fed cattle has gone up significantly in several states. It was reported that Georgia had 40 feedlots feeding 500 head or more annually in 1960, and 26 lots of similar size were counted in Florida. These enterprises are indicative of the progress that has been made. Output of fed cattle in Region 4 is not yet a significant portion of United States production. However, cattle feeders are gaining experience and interest in cattle feeding is high.

Grass has been an important feed in many southeastern cattle feeding operations. It is used to grow out cattle prior to feeding and in some systems grain is fed to cattle on grass in the finishing phase of the feeding program. Citrus fruit by-products also are used as feeds, principally in Florida. Corn, corn silage, and hay are the most

important feeds used in fattening cattle. Some grain sorghums have been used in the western states of the region in recent years.

Region 5 has rapidly become a most important cattle feeding area. In the Southern Great Plains commercial feeding has developed and many large, well organized feedlots are to be found. Farm feeding has increased too, as farmers have sought better outlets for feed and cattle. Both numbers of feedlots and numbers of cattle per feedlot have increased.

In 1961, there were about 450 lots in Nebraska with capacities of 1,000 head or more. Of these about 30 would hold in excess of 10 thousand head. Kansas has also been feeding large numbers of cattle and the trend is towards large feedlots and custom feeding. In 1961, commercial custom feedlots handled about 40 percent of all cattle fed in the state. A 1961 survey showed that Oklahoma had 119 commercial feedlots with more than 40 capable of handling 500 head or more at one time. Farm feedlots are still important in Oklahoma, but in 1960, about 65 percent of the marketings were from feedlots with over 2,000 head capacity. Cattle on feed on January 1, 1962, in Texas totaled 323 thousand head, 27 percent more than were fed one year earlier. Many of them were being fed in the state's 145 feedlots with capacities for 1,000 head or more cattle. Smaller feedlots showed an increase in numbers on feed too. The high plains country of west Texas leads other areas in cattle feeding. It is here that the large supply of grain sorghums are produced, along with good quantities of feeder cattle.

In all states of Region 5, drylot feeding of cattle is predominant. Feed grains used in fattening rations include corn, barley, oats, and grain sorghums. Corn is most important in Nebraska, while grain sorghums have been increasingly utilized in the southern states--Kansas, Oklahoma, and Texas. Alfalfa hay is the principal roughage in rations, but corn and sorghum silage have also been used in areas where irrigation permits production of these crops.

In Region 6, the southwest, a similar kind of development in cattle feeding has been observed. In Colorado, New Mexico, and Arizona large cattle feeding operations have sprung up in recent years and an important part of all cattle fattened in the region has been handled by these feedlots. In other states, farm feeding has increased and a few large enterprises have appeared.

In 1961, some 600 cattle feeders in Colorado fed 850 thousand cattle. Large scale feedlots handled 36 percent of the cattle fed, and non-farm feeding enterprises increased in number from 30 to 59 in the 1953-59 period. There are three major feeding areas in New Mexico--the Pecos Valley, the Rio Grande Valley, and the Clovis area. In the first two, farmer feeders are most important and smaller feedlots prevail. In the Clovis vicinity, large commercial feeders are predominant. In this state there were 43 lots with capacities for 100-500 head, 7 lots in the 500-1,000 head size category, and 26 lots which could handle more than 1,000 head at a time. In 1960, Arizona had 205 feedlots with a total capacity of 320 thousand head for an average of nearly 1,600.

Some of these were smaller farm lots while a few were very large. Since 1955, the total number of feedlots has decreased slightly, but numbers of cattle fed have increased.

Kinds or systems of feeding vary in Region 6, because there are wide differences in climate, topography, and other conditions affecting feed and cattle production. Drylot feeding predominates, but some cattle have been fed on grass, particularly on irrigated pastures. In the southern states grain sorghums are important in rations, and hay and some silage is used as roughage. Barley and hay are the principal feeds in the northern states, and Colorado feeders have access to corn, barley, grain sorghums, and corn silage. Cattle feeding systems in the region have been adapted to available supplies of cattle and feeds; they vary as these supplies change.

Probably the most spectacular development of cattle feeding has occurred in California, in Region 7. In 1945, there were about 125 thousand head on feed on January 1. In 1959, there were 511 thousand. Large commercial feedlots grew in number in this period, so that in 1959 almost 90 percent of all cattle fattened were handled in lots with capacities exceeding 1,000 head. In Washington, a large proportion of the cattle fed are handled in commercial feedlots too. They have grown rapidly in numbers in the last ten years, and in 1960, some 75 percent of the cattle fed went through the big lots. Farm feeding apparently has prevailed in Oregon, but little information is available relative to size and character of feedlot operations.

In California, drylot feeding is most important with corn, barley, and grain sorghums, the principal feed grains used. Silage and hay are utilized in most feeding operations, and some feeders have used green chopped corn and alfalfa. By-products of the vegetable and citrus crops are utilized when available. In Washington and Oregon, barley is the most used feed grain and hay is the most important roughage. Some corn and corn silage is also fed.

It appears that commercial feedlots are largely concentrated in the western and southwestern parts of the United States. California, Colorado, and Arizona have fed large proportions of their cattle in these lots, and output of fed cattle in these states is large. Florida, New Mexico, Texas, Utah, and Washington fed over 75 percent of their cattle in large feedlots, and Alabama and Georgia were feeding almost 50 percent. Output in some of these states is relatively small, but the importance of commercial feedlots is notable.

Marketing of Fed Cattle

The marketing process for fed cattle is similar to that of feeders, with some difference in the kinds of markets used and the direction of movement. Data are limited which will be useful in describing sales and movements, but enough are available to suggest regional dispositions and flows.

Information concerning the marketing of fed cattle is contained in Table X.

TABLE X. PERCENT OF CATTLE SOLD THROUGH DIFFERENT MARKET OUTLETS, BY GEOGRAPHIC REGIONS, 1955.*

Region	Percentage Sold Through Market Outlets						
	Number Marketed	Terminal Public Markets	Auctions	Country Sales			All Others
				Direct to Packers	Local Dealers	Farmers	
	1000 hd.	percent	percent	percent	percent	percent	percent
Northeast	1,302	21.0	35.7	3.4	21.7	15.4	2.8
North Central	18,430	53.8	22.3	10.5	6.1	5.7	1.6
South	7,601	11.9	53.4	6.4	12.0	14.5	1.8
West	6,209	28.8	15.4	24.2	12.8	13.0	5.8
United States	33,542	38.4	28.6	11.8	9.3	9.5	2.4

* Source: United States Department of Agriculture, Market Outlets for Livestock Producers, Market Research Report No. 216, Agricultural Marketing Service, Washington, D. C., 1956.

The data show that in the north central area, terminal markets were the principal outlets for cattle, accounting for 54 percent of all cattle sold in that region. Auctions handled about 20 percent of the cattle sold and 10 percent went directly to packers. Sales to dealers and country sales to farmers amounted to 16 percent of the total and probably included some unfinished cattle and older stockers and feeders. In the South, auctions were the principal market outlet for cattle. About 53 percent of the cattle sold were marketed through auctions. In the northeast area, 21 percent of the cattle were marketed through public markets, almost 36 percent went through auction markets and only 6 percent moved directly to packers. A considerable number of cattle were sold to dealers and farmers. In the West, direct sales to packers were more important than in any other area. About 24 percent were so sold. Terminal markets handled almost 29 percent of these cattle, and auctions sold 15 percent of them. About equal numbers of cattle went to dealers and farmers.

Very little information about the movement of fed cattle to slaughter establishments was found. No data were available from state statisticians, except for California, and the only other information found was relevant to the West.

It seems likely that cattle fed in the Midwest were not often moved long distances for slaughter. Packing plants have existed in large numbers in the regions where cattle feeding has been important, and it has not been necessary to ship slaughter stock great distances.

In the West there have been some fairly distant movements of fed cattle. They have resulted from the increasing demand for slaughter animals in California and the inability of coastal producers and feeders to supply the needs of packers.

The extent to which packers have reached out into the mountain and plains states for fed cattle was described in a study of the Western Livestock Marketing Research Committee.^{21/} Their researchers developed lines of east-west movement for four time periods which showed the boundaries of the supply area. They are reproduced in Figure 5.

In 1960, it was estimated that the supply area of California packers included all the mountain states and half of Texas.^{22/} This means that some shipments of cattle covered over 1,000 miles.

These and some other limited data were used to develop a flow diagram for fed cattle similar to that for feeder cattle.^{23/} It is as accurate as the data allow and provides a useful picture of cattle movements. It is reproduced as Figure 6.

^{21/} Western Livestock Marketing Research Committee, Shifts in the Trade in Western Slaughter Livestock, United States Department of Agriculture, AIB No. 14, Washington, D. C., United States Government Printing Office, 1950, p. 44.

^{22/} Estimate by the Extension Economists, Montana State College, reported in The Economics of Cattle Feeding Special Report No. 1, Cooperative Extension Service, Montana State College, Bozeman, Montana, 1961.

^{23/} See also Table X in Appendix.

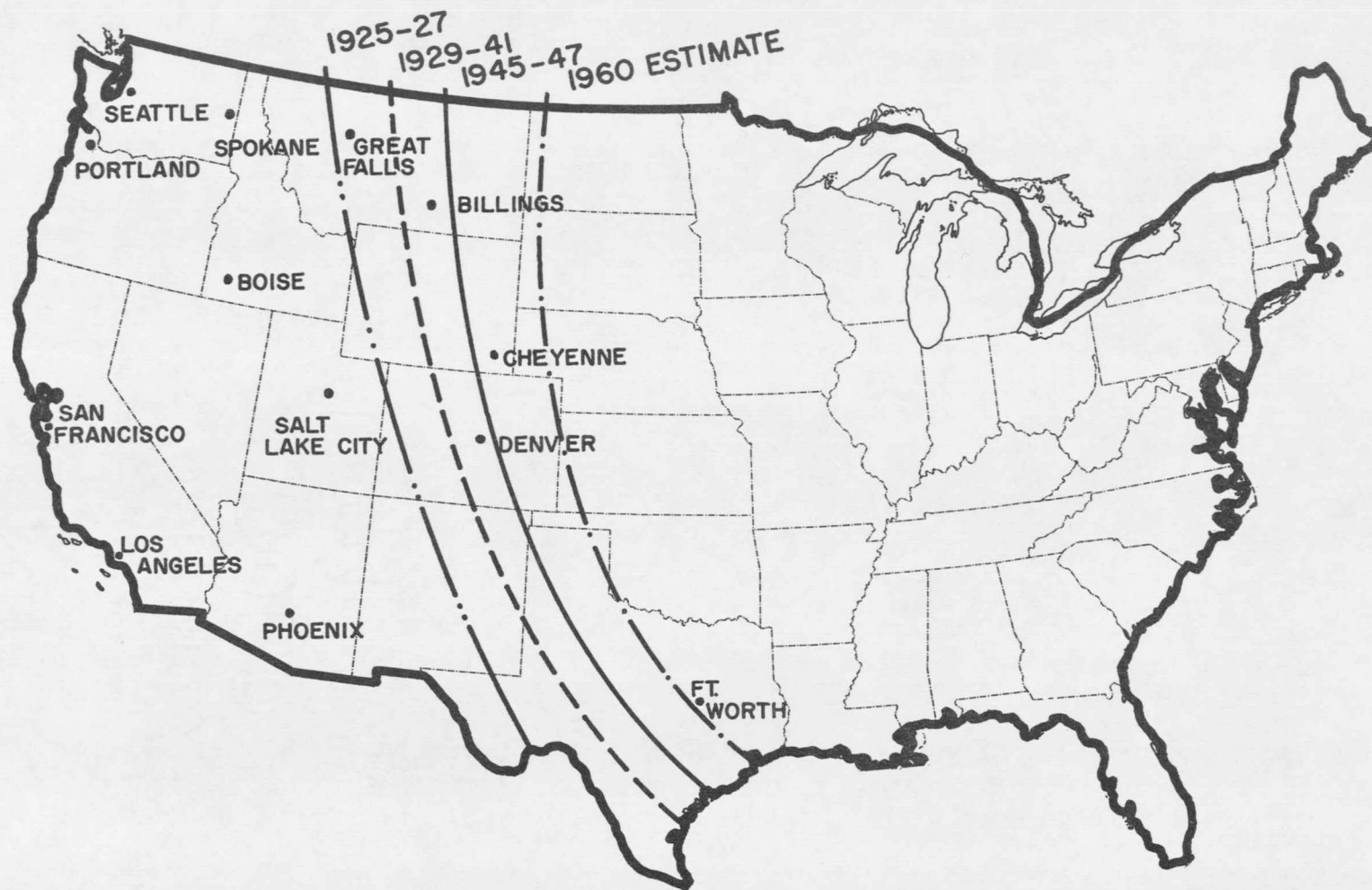


Figure 5. Line of East - West Movement Describing Supply Area for California Packers.

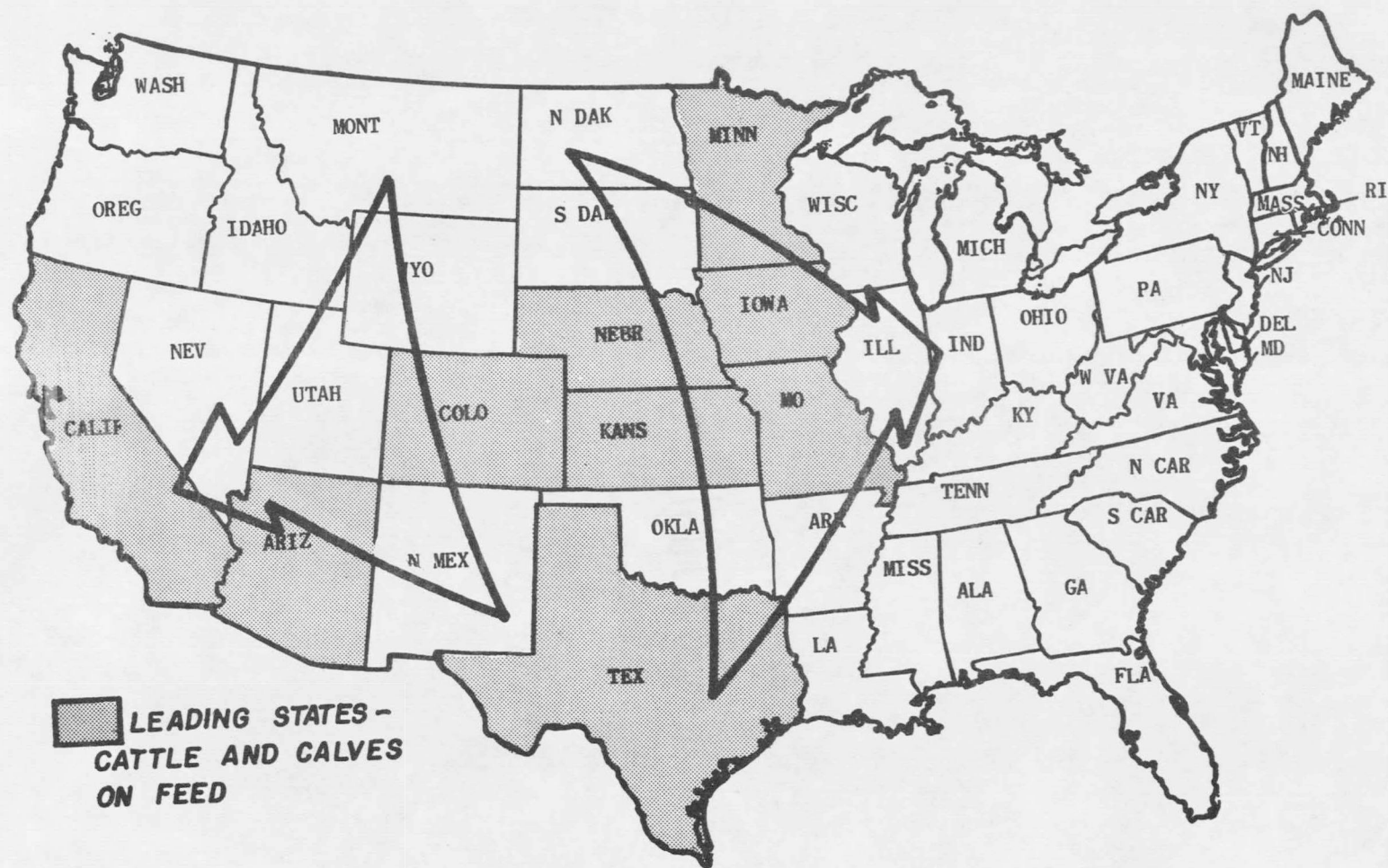


Figure 6: General Direction of Flow of Fed Cattle From Areas Where Cattle Are Fed to Areas Where They are Slaughtered

Cattle Slaughter

The final destinations of fed cattle are packing plants where they are slaughtered and processed for distribution to the wholesale and retail trade. These packing plants are located throughout the United States. They vary in kind and size and their operations are affected by a variety of conditions. Some large plants process beef for many wholesale and retail establishments, with a few marketing brand-name products. Others produce beef only for local retail firms; the scope of their operations is quite small. Altogether these firms slaughtered over 30 million cattle and calves in the last five years.

Slaughter of cattle in the seven regions is shown in Table XI.

TABLE XI. COMMERCIAL CATTLE SLAUGHTER, NUMBER OF HEAD, 7 REGIONS, 1956-60.*

	Cattle Slaughtered ^{a/}				
	1956	1957	1958	1959	1960
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1	579	581	541	514	537
Region 2	10,480	10,468	9,654	9,387	10,003
Region 3	2,155	2,175	2,010	1,883	1,933
Region 4	3,165	3,422	2,813	2,344	2,695
Region 5	5,562	4,962	4,361	4,455	5,129
Region 6	1,557	1,483	1,441	1,507	1,745
Region 7	3,662	3,139	2,731	2,838	3,178
United States	26,861	26,231	23,555	22,930	25,224

* Source: United States Department of Agriculture, Livestock and Meat Statistics, Statistical Bulletin No. 230, Agricultural Marketing Service, Washington, D. C., 1960.

^{a/} Includes slaughter under federal inspection and other commercial slaughter; excludes farm slaughter.

It is apparent that Region 2 was the leader in numbers of cattle slaughtered in the five year period, and it was found that 70 percent of all cattle killed for beef were slaughtered in Regions 2, 5, and 7. Cattle slaughter in Region 4 almost equaled that of Region 7, and it has been increasingly important in the southeast states in recent years. Slaughter in Region 1 amounted to only 500 thousand head, an insignificant part of the total.

In Table XII, the number of slaughter establishments are recorded by size for each of the seven regions. The table is useful in describing the kinds and sizes of packing plants.

TABLE XII. NUMBER OF SLAUGHTERING ESTABLISHMENTS, 7 REGIONS, UNITED STATES, 1955 AND 1960.*

	Under Federal Inspection		Other Commercial Large		Medium		Total Establishments ^{a/}	
	1955	1960	1955	1960	1955	1960	1955	1960
Region 1	12	12	13	16	35	29	60	57
Region 2	140	163	300	259	485	446	925	868
Region 3	80	87	151	142	388	370	619	599
Region 4	61	76	228	237	491	451	780	764
Region 5	59	78	125	127	214	221	398	426
Region 6	25	31	42	43	86	109	153	183
Region 7	78	83	93	78	111	86	282	247
United States	455	530	952	902	1,810	1,712	3,217	3,144

* Source: United States Department of Agriculture, Number of Livestock Slaughter Plants, Agricultural Marketing Service, Mt An 1-2-2 (60), Washington, D. C., 1960

^{a/} Includes all plants with an output of 300,000 pounds or more live weight annually.

On March 1, 1960, there were 3,144 livestock slaughtering plants in the United States with an annual output of 300,000 pounds or more. About 17 percent of this number were federally inspected; the balance were commercial non-inspected plants. Of the 2,614 plants not under federal inspection, 902 were large plants with an annual output of more than 2 million pounds live weight annually. These large plants made up 29 percent of the combined total output for inspected plus non-inspected plants. Medium non-inspected plants numbered 1,712 and were 54 percent of the total of all plants. In 1959, there were also 6,500 small non-inspected plants that slaughtered less than 300 thousand pounds of live weight annually. Slaughter in the 3,144 plants accounted for 99 percent of the total commercial slaughter in 1959, and slaughter in the 530 federally-inspected plants accounted for 81 percent of the total commercial slaughter in that year.

So it is evident that the output of small plants was a quite insignificant part of total output, and output of non-federally inspected plants was not too important.

In 1960, over 30 percent of the federally-inspected packing plants and 20 percent of the large and medium non-federally inspected plants were located in Region 2. It was here that almost 40 percent of all cattle slaughtered were processed. So this region can be seen to be important in terms of slaughter facilities and total kill of cattle. Regions 3, 4, 5 and 7 contained about equal numbers of federally-inspected plants, but Region 3 and 4 were leaders in the number of

non-federally inspected plants in 1960. In Region 1 and 6, small numbers of federally-inspected plants were found, and only about 200 non-inspected plants were operating in both regions.

Distribution of Beef

The distribution of beef from slaughter establishments to wholesale and retail outlets could not be established for each of the 7 regions. However, the general pattern of distribution for meats in the United States has been identified; it is appropriate to a description of the marketing of beef in the various regions.

The distribution channels through which meat moved in 1954 are shown in Figure 7.^{24/}

In 1954, packer sales direct to retailers were 65 percent of all their sales. It is likely that this percentage has increased since 1954, but no data are available to support this presumption. Packer sales to branch houses were 19 percent of the total, and sales to independent wholesalers were 17 percent of total sales. There is evidence that branch houses may have declined in importance since 1954 while independent wholesalers may have taken a larger proportion of packer sales. But the significant movement of beef is from packers direct to retailers.

Consumption of Beef

To complete the description of the beef cattle industry, data

^{24/} Table XI in Appendix is the basis for this figure.

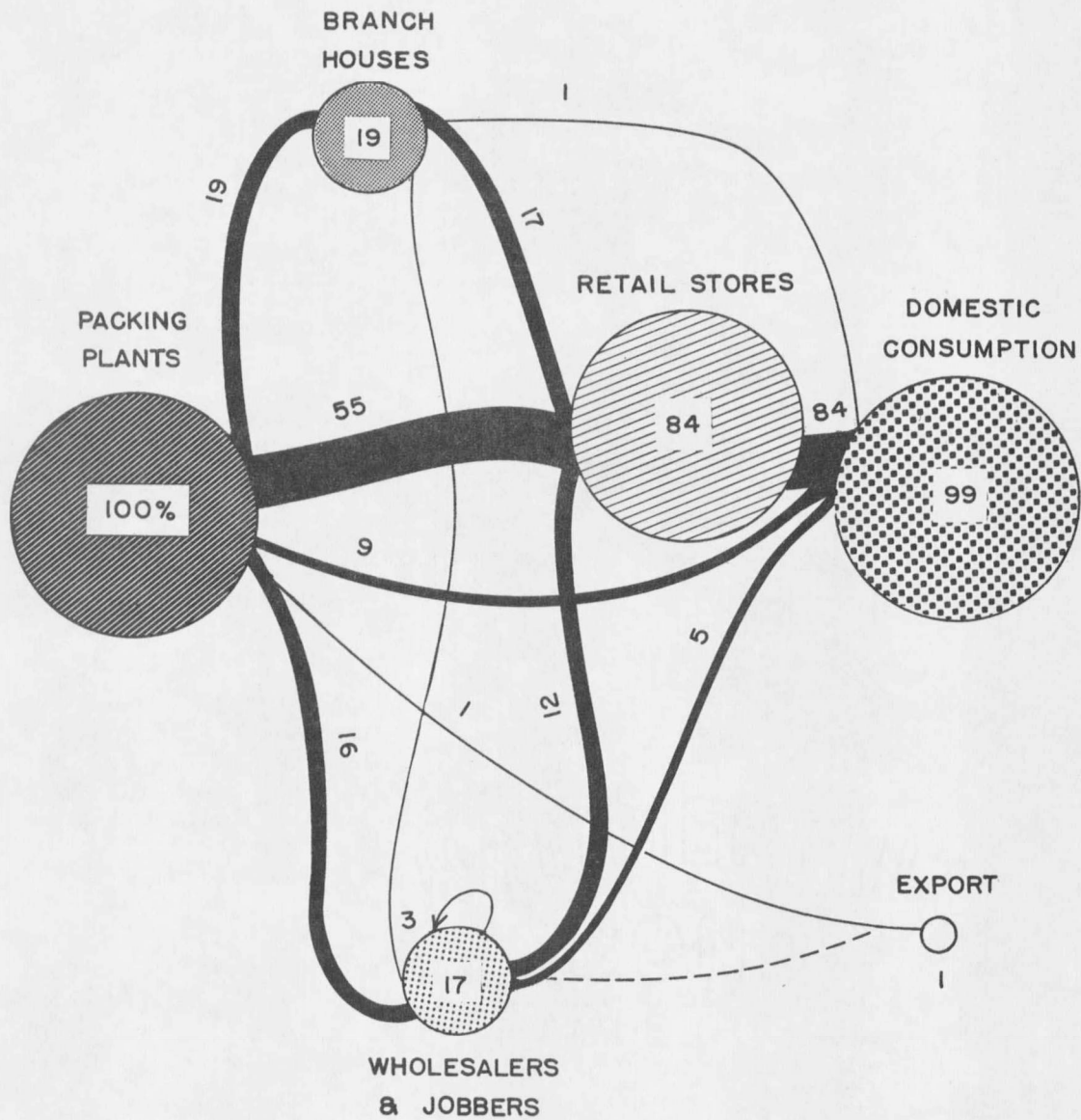


Figure 7. Meat Distribution Channels, United States, 1954.

relative to consumption of beef were assembled. They are contained in Table XIII which shows consumption in the seven regions.^{25/}

TABLE XIII. BEEF CONSUMPTION IN UNITED STATES, BY REGIONS, 1960.*

	Population	Per Capita Beef Consumption	Beef Consumption ^{a/}
	Thousands	Lbs.	Mil. Lbs.
Region 1	1,988	103.6	206.0
Region 2	46,716	103.6	4,405.1
Region 3	44,677	87.2	3,895.8
Region 4	42,301	57.9	2,449.2
Region 5	15,498	103.6 ^{b/}	1,061.4
Region 6	6,153	111.1	686.8
Region 7	20,339	111.1	2,259.7
United States (48)	177,700		14,964.0

* Sources: United States Department of Commerce, U. S. Census of Population, 1960, Bureau of the Census, Washington, D. C., 1960. United States Department of Agriculture, Food Consumption of Households in the United States, HFC 1, Washington, D. C., United States Government Printing Office, 1956.

^{a/} Primary distribution (carcass) weights.

^{b/} In two of the four states in Region 5, per capita consumption was 57.9 pounds.

In 1960, 47 million people of Region 2 consumed approximately 4.4 billion pounds of beef, 29 percent of total beef consumption in the

^{25/} See also Table XII in Appendix.

United States. This was sufficient to make this region rank first in beef utilization. In Region 3, where the per capita consumption was lower, 45 million people consumed 3.9 billion pounds of beef, or 26 percent of the total. It was expected that beef consumption would be high in these regions, for they were the heavily populated areas in the United States. Region 4 ranked third in total beef consumption in 1960. In that region, some 42 million people consumed about 2.5 billion pounds of beef. In this region, per capita consumption of beef was least. On the West Coast, in Region 7, about 20 million people consumed almost 2.3 billion pounds of beef. In this region, as in Regions 1 and 6, per capita consumption of beef was highest at 111.1 pounds per person. The population of this region has increased rapidly in recent years and it has fast become an important market for beef. Consumption in Regions 1, 5, and 6 amounted to 206, 1,061, and 687 million pounds respectively. Per capita consumption in these regions was high, but these were regions of low population density. These data concerning consumption indicate where the important markets for beef exist.

Summary

As a summary of this description of the beef cattle industry and to highlight some important aspects of it, Figures 8, 9, 10, 11, and 12 were prepared. These figures show where production of cattle and feed is most important, where many of the cattle are fed, where much of cattle slaughtering occurs, and where consumption of beef is most

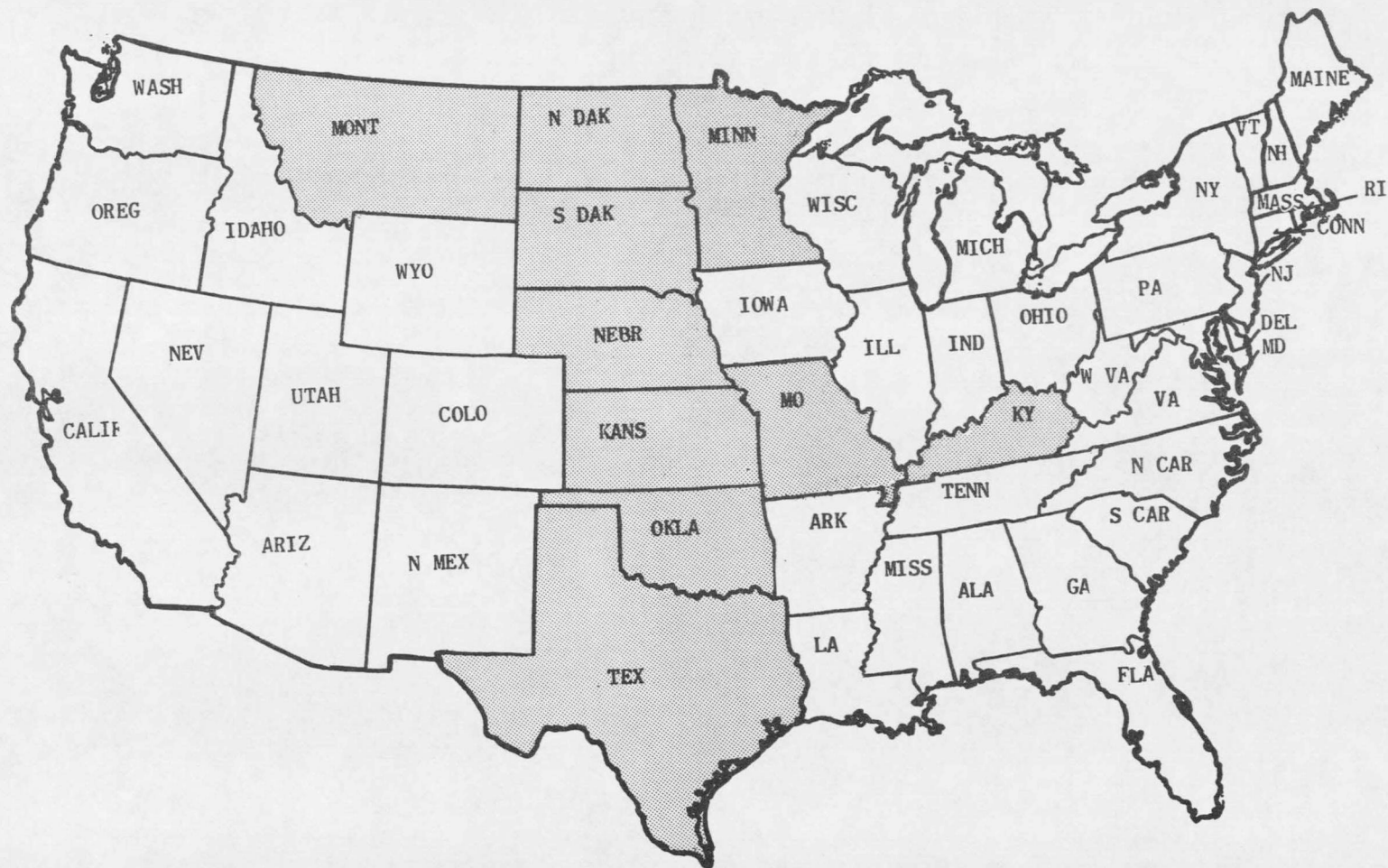


Figure 8: Ten Leading States, Production of Cattle Available for Feeding, United States, 1960

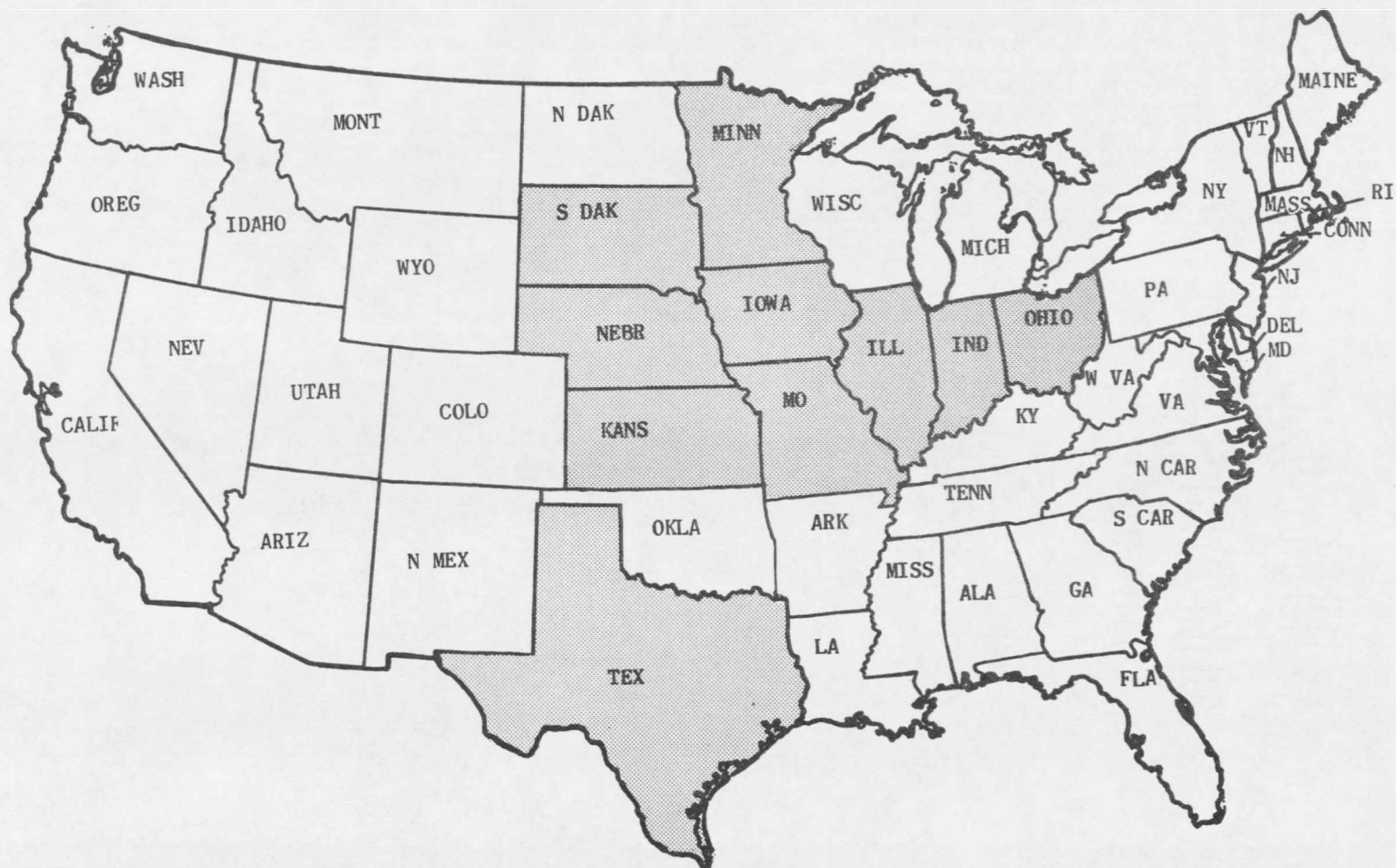


Figure 9: Ten Leading States, Production of Feed Grains, United States, 1960



Figure 10: Ten Leading States, Numbers of Cattle & Calves on Feed, United States, 1960

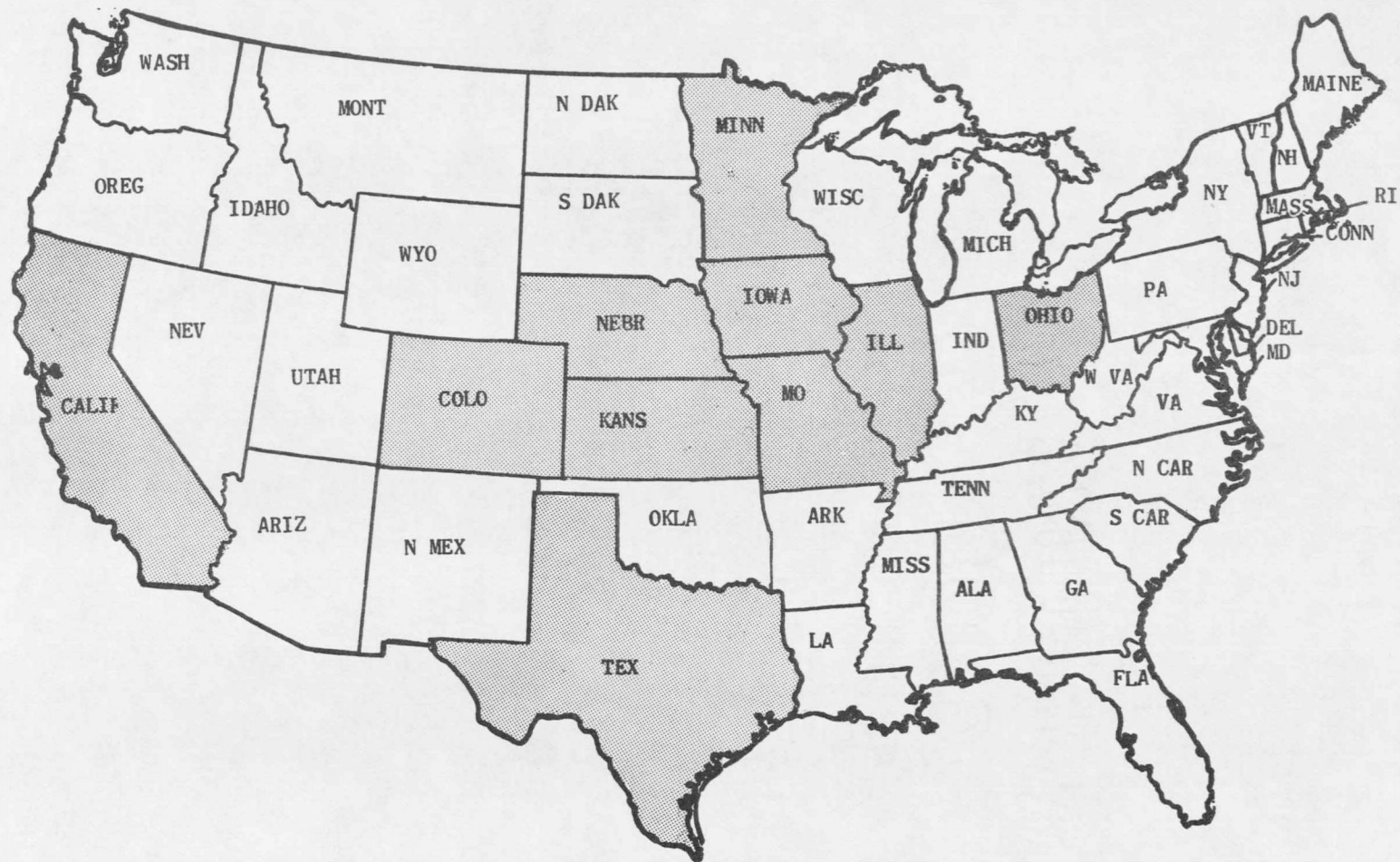


Figure 11: Ten Leading States, Commercial Cattle Slaughter, United States, 1960

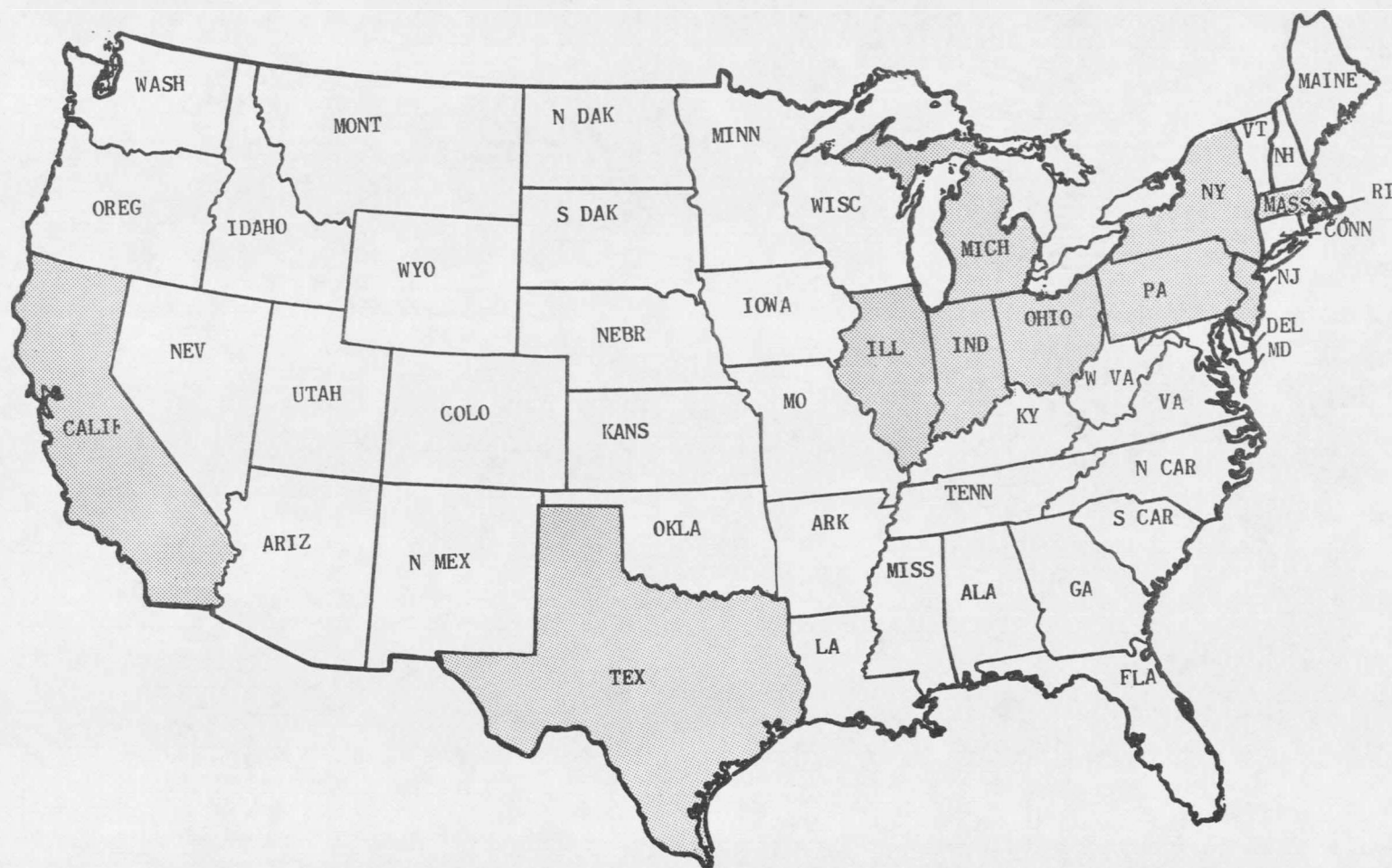


Figure 12: Ten Leading States, Total Beef Consumption, United States, 1960

important. They are indicative of the concentration of cattle and feed production, cattle feeding and slaughter in the central states (Region 1, 2, and 5) and of the importance of the northeast states (Region 3) in beef consumption. They are descriptive of the present organization of the beef industry.

Potential for Development of Cattle Feeding in the Northern Great Plains

Each of the seven regions described in this report has some potential for development of cattle feeding. In some of them, cattle are produced in quantities which exceed needs for feeding. In all of them, surplus feed is ordinarily produced. The potential in the various regions obviously is different, but wherever cattle and/or feeds are available in surplus quantities, a base for some new or expanded feeding operation exists.

In the Northern Great Plains both feeder cattle and feeds are available in surplus quantities. Cattle are exported to the Midwest and West for feeding and feed grains are shipped out of the region to be utilized as livestock feeds or to be exported. The cattle and feed grains now leaving the state could be used in the development of cattle feeding.

The extent to which cattle feeding could develop in the region is indicated by data in Tables XIV, XV, and XVI.^{26/}

Table XIV shows the production and utilization of feeds and cattle

^{26/}

The calculations relevant to the projections in Tables XV and XVI are exhibited in Tables XIII through XXII in the Appendix.

in the 1956-60 period, and the data are indicative of the immediate potential for development of feeding.

TABLE XIV. PRODUCTION OF FEED GRAINS AND CATTLE AND UTILIZATION IN CATTLE FEEDING, AVERAGE FOR 1956-60, REGION 1.*

State	Production		Utilization	
	Feeds ^{a/}	Cattle ^{b/}	Feeds ^{c/}	Cattle ^{d/}
	1000 bu.	1000 hd.	1000 bu.	1000 hd.
Montana	51,600	766	6,050	110
N. Dakota	151,000	578	11,110	202
S. Dakota	198,850	971	21,175	385
Region 1	401,450	2,315	38,335	697

* Sources: Tables XIII and XIX in Appendix.
United States Department of Agriculture, Cattle and Calves on Feed, Statistical Bulletin No. 277, Agricultural Marketing Service, Washington, D. C., 1960.

^{a/} See Table XIII in Appendix.

^{b/} See Table XIX in Appendix.

^{c/} Utilization of feeds computed by multiplying the number of cattle fed by 55 bushels of feed grains per head.

^{d/} Utilization of cattle in cattle feeding taken from Cattle and Calves on Feed, loc. cit.

In this period average production of all feed grains exceeded their use in cattle feeding by about 1,000 percent. The average number of cattle available for feeding exceeded the average number placed on feed by more than 300 percent. Production and utilization varied as shown in Table XIV, but in each state utilization of both feed and cattle in feeding operations was a fraction of production.

Production of feed grains in 1965 is likely to be restricted by a national feed grain program that will control acreages seeded to corn, oats, barley, and grain sorghums. Production as projected in Table XV will be 96 percent of the 1956-60 average.

TABLE XV. PRODUCTION OF FEED GRAINS AND CATTLE, AND UTILIZATION IN CATTLE FEEDING, 1965 PROJECTIONS, REGION 1.*

State	Production		Utilization					
	Feeds ^{a/}	Cattle ^{b/}	25% Cattle Fed Feeds ^{c/}	Cattle	50% Cattle Fed Feeds ^{c/}	Cattle	100% Cattle Fed Feeds ^{c/}	Cattle
	1000 bu.	1000 hd.	1000 bu.	1000 hd.	1000 bu.	1000 hd.	1000 bu.	1000 hd.
Montana	61,328	862	11,438	215	22,929	431	45,858	862
N. Dakota	155,880	633	8,406	158	16,811	316	33,676	633
S. Dakota	169,141	1,054	14,045	264	28,036	527	56,073	1,054
Region 1	386,349	2,549	33,889	637	67,776	1,274	135,607	2,549

* Source: Tables XVIII and XXII in Appendix.

^{a/} See Table XVIII in Appendix.

^{b/} See Table XXII in Appendix

^{c/} Utilization of feed computed by multiplying the possible numbers of cattle fed by 53.2 bushels of feed grains per head (feed requirement assumes an increase in efficiency of feed conversion of 3.3 percent).

Feeder cattle production will probably be up as shown in Table XV. An output of 2,549 thousand head is estimated for 1965, about 110 percent of the number produced in 1956-60. An increase in the calf crop and decreases in calf deaths and commercial slaughter will add to output.

If the number of cattle available for feeding does climb to 2,549 thousand, and 25 percent of this number is fed in Region 1, fewer cattle will be fed in 1965 than in 1956-60. But if 50 percent of the cattle available are fed, the numbers of cattle so utilized will amount to 1,274 thousand or 183 percent of the 1956-60 average. If all cattle available for feeding in Region 1 in 1965 are placed in feedlots in the area, some 2,549 thousand head will be fed, about 365 percent of the 1956-60 average.

With a production of feed grains of 386 million bushels in 1965, all cattle available for feeding could be fed in Region 1. About 250 million bushels of feed grains would remain for seed, export, other livestock feed and other uses.

Production of feed grains and cattle in 1975 will depend on many variable factors, only some of which can be anticipated at this time. The projections of production are shown in Table XVI.

Production of feed grains in Region 1 is expected to reach 522,650 thousand bushels in 1975. This is 138 percent of the average for 1956-60. The projection assumes feed grain production in Region 1 which is the same proportion of United States production as it was in 1956-60. Total United States production is estimated to equal requirements in 1975. Feeder cattle production should be up to about 132 percent of the 1956-60 average. Cattle available for feeding will then exceed 3,000 thousand head, with some of the increases due to higher calf crops, fewer deaths, and reduced calf slaughter. Changes in

TABLE XVI. PRODUCTION OF FEED GRAINS AND CATTLE AND UTILIZATION IN CATTLE FEEDING, 1975 PROJECTED, REGION 1.*

State	Production		Utilization					
	Feeds ^a / 1000 bu.	Cattle ^b / 1000 hd.	25% Cattle Fed Feeds ^c / 1000 bu.	Cattle 1000 hd.	50% Cattle Fed Feeds ^c / 1000 bu.	Cattle 1000 hd.	100% Cattle Fed Feeds ^c / 1000 bu.	Cattle 1000 hd.
Montana	82,600	1,062	13,118	265	26,284	531	52,569	1,062
N. Dakota	224,725	730	9,058	183	18,067	365	36,135	730
S. Dakota	245,325	1,268	15,691	317	31,384	634	62,766	1,268
Region 1	552,650	3,060	37,867	765	75,735	1,530	151,470	3,060

* Sources: Table XVII and XXI in Appendix.

^a/ See Table XVII in Appendix.

^b/ See Table XXI in Appendix.

^c/ Utilization of feed computed by multiplying the possible number of cattle fed by 49.5 bushels of feed grains per head (feed requirement assumes an increase in efficiency of feed conversion of 10 percent).

production and utilization in Region 1 are not assumed to be in exact proportion to those in the United States. Circumstances peculiar to the region require that some adjustments in estimates be made.

If cattle available for feeding in Region 1 do increase to 3,060 thousand head, and 25 percent of them are fed in the region, about 765 thousand head would go into feedlots in Montana, North Dakota, and South Dakota. This number would be 110 percent of the average number on feed in 1956-60. If 50 percent of the cattle available for feeding are fed in the region, 1,530 thousand head would go into feedlots in the three

state area. If all cattle available for feeding in 1975 are fed in Region 1, the number placed in feedlots would be 439 percent of the average for 1956-60. So it is evident that feed grains and cattle in Region 1 will provide a considerable base for an expansion of cattle feeding if production equals expectations.

Prospects for Development of Cattle Feeding
in the Northern Great Plains

The availability of cattle and feed grains in the Northern Great Plains will not guarantee the development of new or expanded cattle feeding enterprises. In other regions where cattle and feed are produced, there is a potential for such a development. Interest in cattle feeding is as keen in these regions as it is in Region 1. So it appears that an expansion of feeding operations in Region 1 will depend on the capacity of feeders to compete with other regions in the markets for fed cattle. They must develop the kinds of enterprises that will produce slaughter animals at costs which will compare with other regions, and they must be able to sell their products effectively.

The competitive position of cattle feeders in the Northern Great Plains will depend on (1) the ability of feeders to produce large numbers of high quality cattle on a continuous basis, (2) the relative costs of production of fed cattle, (3) the markets for fed cattle within and outside of Region 1, (4) the marketing costs for cattle feeders in various locations in the region, and (5) market prices for fed cattle. There are other factors which will also affect the competitive position,

but these are of greatest importance and need to be examined in detail.

Production of Fed Cattle

To satisfy the requirements of meat packers (who are in turn meeting the demands of wholesalers and retailers of beef), cattle feeders will have to develop operations which will produce regular and continuing supplies of fed cattle that will meet age, sex, grade, and weight specifications. This means that seasonality in the production and marketing of feeder and fed cattle will have to be reduced and virtually eliminated, that careful attention will have to be given to the kinds and conditions of cattle being fed, and that feed lot operations will have to be timely and adequate.

The extent of seasonality in the marketing of feeder cattle can be seen in Figure 13, which shows out-of-state marketings of Montana steers, heifers, and calves by months.

Selling of feeder cattle is concentrated in the months of September, October, and November, with about 43 percent of all these cattle going to market in October. A similar marketing pattern is evident in North Dakota and South Dakota. In these states market fluctuations may not be as severe as in Montana, but data in the annual reports of the state statisticians show marketing of cattle and calves to be bunched in the fall months.

Marketing patterns such as these are not compatible with regular, continuous feeding operations, and if cattle feeding is to develop,

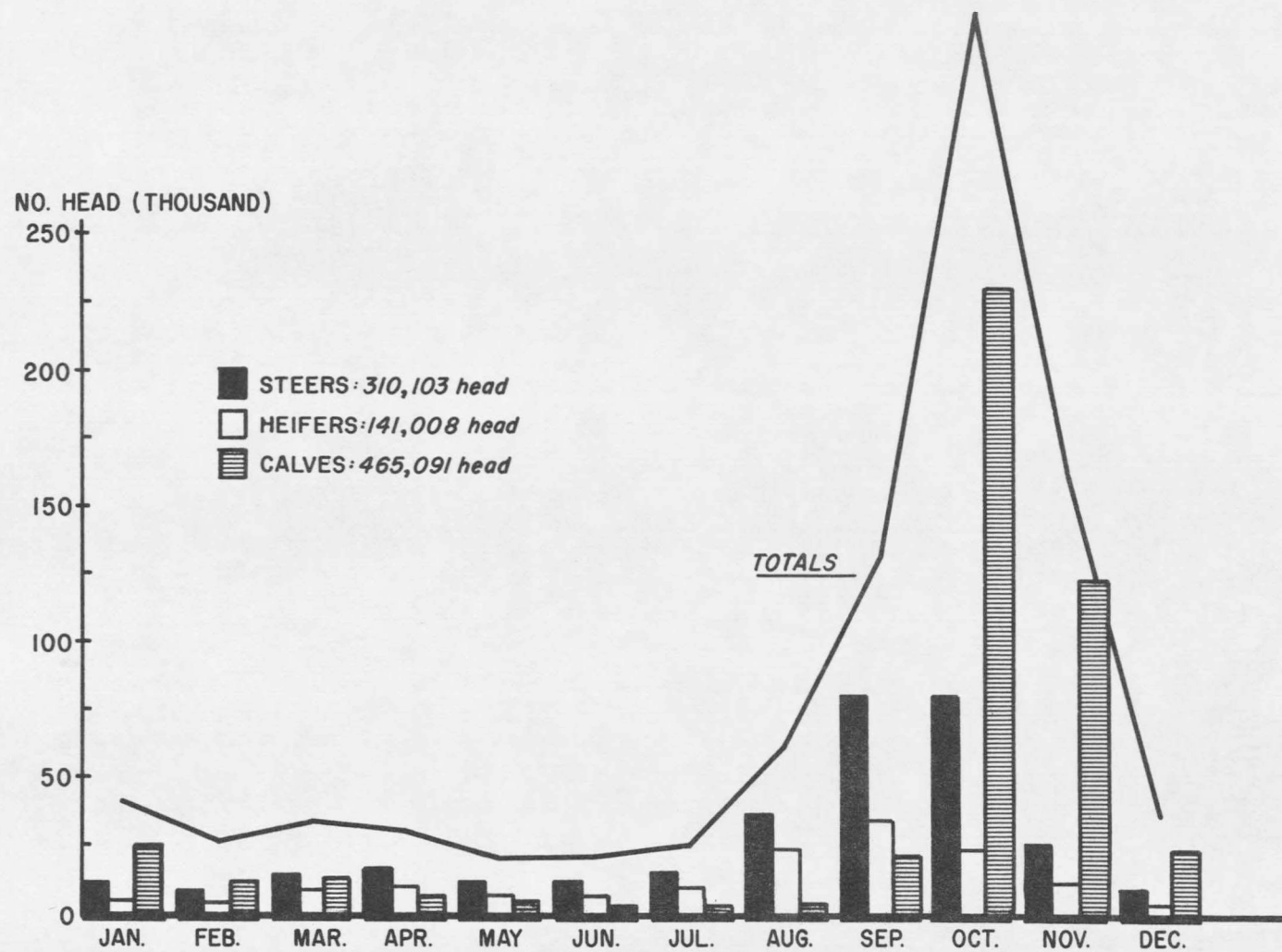


Figure 13. Out of State Marketings of Montana Steers, Heifers and Calves by Months, 1960.

some adjustment in production will be necessary. These adjustments can conceivably be made by the producers of feeder cattle, by cattle feeders themselves, by third parties who will assume responsibility for holding cattle for short periods, or by all of these interacting.

Periodic and regular marketings of feeder cattle by the producers of these cattle would do much to eliminate seasonality in market receipts. Such a marketing practice can be instituted on some ranches, and it may come about if the ranchers are adequately compensated for their action. Of course the withholding of calves from market at weaning time, and the maintenance of these cattle until such time as the market demands them, will involve an expenditure of time, money, and other resources. Ranchers must be reimbursed for their expenditures through higher prices for "warmed up" cattle.

It is also possible that cattle feeders can make provisions for off-season needs for feeder cattle. They may allocate space and feed for the holding and maintenance of cattle purchased in the fall so that these cattle can be drawn into the feeding operations when necessary. This action by feeders will stabilize the supply of feeder cattle, but it will require that time, labor, feed and space be allocated to the operation. Cattle feeders will probably hesitate to assume this responsibility unless they can anticipate a price for fed cattle which will compensate them for the effort.

There may be an opportunity for third parties to participate in this process of adjustment of seasonal marketing patterns of feeder

cattle. On many crop farms, there is available in the fall under-employed labor, crops, crop residues, and sufficient facilities to support holding and maintenance operations for cattle. These kinds of operations are not uncommon in irrigated valleys where hay, sugar beets, beans, peas, etc. are grown, and some individuals have made warming up operations major enterprises on their farms. Farmers undertaking these operations will need to be informed about the role they are playing, and their operations must be sufficiently flexible to allow for periodic marketings of cattle.

The reduction of seasonality in the marketing of feeder cattle will probably come about (if it does at all) as a result of holding and maintenance operations involving all three groups--cattle feeders, cattle producers, and crop farmers or other third parties. Some participation of persons in each of these groups is now evident, but the required operations are not yet adequately performed, and seasonality in marketing of feeder cattle is a problem.

While the development of regular and continuing feeding operations is greatly dependent on the solution of the feeder supply problem, it is also going to require some reorganization of feeding enterprises. Only a few of the feedlots in Region 1 are now year-around operations which turn out fed cattle on a monthly or weekly basis. Most of them are farm feedlots which have been termed "one shot" operations, and they produce only one lot of fed cattle each year. These enterprises will not ordinarily produce cattle which will satisfy the requirements of

packers. Some adjustment will be necessary. In the case of farm feedlots it appears that a change to twice a year feeding operations will be necessary if these enterprises are to be at all competitive. In addition, attention will have to be given to market demands, and operations must be sufficiently flexible so that gluts and shortages can be avoided. To achieve real continuity in fed cattle production, additional numbers of large year-around feeding operations will probably be necessary. This will require considerable development of present feedlot enterprises or new ones. It seems likely that this kind of adjustment will take place if cattle feeding develops significantly in Region 1.

To meet the quality specifications of the meat packers, cattle feeders will have to give a great deal of attention to cattle they buy, the feeding and finishing process, and the cattle they sell. They must be sure that fed cattle meet the specifications of the markets they are selling in. Most wholesalers and retailers have their particular specifications for beef carcasses. These are known by the packers, and they pass them on to cattle feeders in the form of age, grade, sex and weight specifications for fed cattle. The feeders must know what kinds of calves or yearlings to buy and feed to meet the packers' requirements, and they must actively seek the kinds that are needed.

Many cattle feeders, particularly those with large scale operations, now buy their cattle from certain producers or in particular areas year after year. These sources of supply have been proven to be dependable,

and the kinds of cattle needed by feeders have been available annually. In most cases, procurement practices have been of an informal nature with buyers and sellers meeting annually for the purpose of negotiating sales. But a few buyers and sellers have executed sales contracts which obligate the producers to deliver specified quantities of feeder cattle which meet age, sex, weight and grade requirements. Price is determined in various ways in these contracts--through negotiations, as a percent of market price, or according to some other agreed on procedure. Production and sale by contract may be increasingly important to feeder cattle producers and cattle feeders, as the requirements for particular kinds and qualities of cattle become more critical.

Relative Costs of Production

The costs incurred in feeding cattle and calves will also influence the competitive position of feeders in the Northern Great Plains. They will be an important part of the total costs of producing and marketing fed cattle, and they will affect the marketability of these cattle, within and outside the region.

Costs of feeding representative of several types or kinds of feeding operations were obtained from states in Regions 1, 2, 5, 6, and 7. They were divided into categories representing investment requirements, non-feed costs, cattle costs, and feed costs for the purpose of analysis.

While an attempt was made to make the cost data as uniform as possible, using the 1959-60 feeding period when possible and categorizing

costs in the same manner for each state, the data were dissimilar in many ways. These dissimilarities limited the usefulness of the cost data for the various states in comparing cattle feeding costs, but they did provide some indication of relative cost of feeding in several states.

Investment Requirements

Data concerning investment requirements for large commercial feedlots in California, Arizona, and South Dakota, and for farm feedlots in Texas, Washington, and Montana were assembled and compared. While this information was somewhat limited, it does represent investments in some important feeding areas in the United States.

Average investments per head for four groups of feedlots in California were reported by Hopkin.^{27/} The four groups included 77 feedlots scattered throughout the state which are representative of most cattle feeding enterprises. The average capacity for feedlots in each of the four groups was 722, 1974, 5426, and 13,222 head. The range of per head investment was from \$35.37 to \$16.36 with the higher requirements prevailing for the small feedlots and the lower requirements found in the large feedlots. Hopkin points out that the differences in investments per head fed are due primarily to the higher utilization of capacity of the larger feedlots. Utilization varied from 120 percent in the smaller lots to 203 percent in the larger lots.

^{27/} John Hopkin, Cattle Feeding in California, Economics Department, Bank of America, San Francisco, California, 1957.

In an Arizona study, feedlots were classed on a different basis according to the kind of ration which prevailed.^{28/} One ration was predominantly silage; another was composed principally of dry feeds; and a third utilized green chopped feeds. Those lots which fed silage and dry feed are about equal in size to those in group 2 in the California study. The lots feeding green chop were smaller. Investment costs per head were \$24.56 for the lots feeding silage, \$34.62 for those feeding dry feed, and \$36.25 for lots feeding green chop. Two-thirds of the lots studied fed silage and investments were lower for these lots. It should be noted that the utilization of lots feeding silage was fairly high, about 180 percent. This contributed to a lower investment per animal. The rate of utilization was high for feedlots feeding dry feeds too, but total investments in machinery, equipment, and facilities were greater for these lots.

The investment requirement for a large feedlot in South Dakota was budgeted by Helfinstine.^{29/} He was interested in the prospects for co-operative feeding. This lot would have a capacity of 5,000 head, and 7,500 cattle would be fed annually.^{30/} Investment per head was

^{28/} Leo J. Moran, Non-feed Costs of Arizona Cattle Feeding, Technical Bulletin No. 138, Agricultural Experiment Station, University of Arizona, Tuscon, 1960.

^{29/} Rex Helfinstine, Economic and Organizational Aspects of Cooperative Feeding, Bul. 494 Economics Department, Agricultural Experiment Station, South Dakota State College, Brookings, 1960.

^{30/} See Table XXIII in Appendix.

expected to be \$30.45. This is higher than three of the four groups of feedlots in California and lower than two of the three feedlots in Arizona. This investment per head could be further reduced if greater numbers of cattle were fed annually, and it would then be similar to the investment requirements of most large feedlots considered here.

Investments per head for typical farm feedlots in west Texas were found to be \$48.24 and \$35.97.^{31/} These were appropriate to 100 and 500 head feedlots which were filled once each year. Of interest is the greatly reduced per head investment for feed processing equipment which was found for the larger lots. Some economy of size was apparent in this case.

Data for two types of feedlots were reported from Washington too.^{32/} The lots were similar in size but quite different in organization. The first feedlot fed two groups of cattle each year with a ratio of number fed to capacity of 2.0 while the second lot fed one group of cattle which utilized the entire capacity of the feedyard. For the first lot, in which 500 head of cattle were fed, investment per head was \$22.20. For the second lot, where 200 head of cattle were fed, the investment requirement was \$34.57 per head. Obviously the per head investment was reduced

^{31/} Magee, Marian, Fisher and Hughes, Economics of Cattle Feeding Systems in West Texas, Bulletin 880, Agricultural Experiment Station, Texas A and M, College Station, 1961.

^{32/} Jay Swanson, Estimated Cost of Feeding Yearlings in Yakima County, 1958, Circular 360 Agricultural Experiment Station, Washington State University, Pullman.

in the first lot by greater utilization of plant and facilities through a year-around feeding operation.

A study of farm feedlots in Montana produced data on investment requirements for 34 feedlots grouped in five size categories.^{33/} Within these five groups, the number of cattle fed annually increased from an average of 36 to 466. Investments per head ran from \$65.81 down to \$29.11 per head, a rather wide range for feedlots which were typically supplemental enterprises on farms.

An explanation of some of the differences in investment requirements was found in a publication by Helfinstine.^{34/} He calculated the required investments for feedlots with varying amounts of mechanical equipment, and found that additional equipment affected investments per head significantly. For feedlots of 200 head capacity, investments increased from \$43.00 for a minimum equipment lot to \$156.00 for a lot with auger bunks and other refinements. His findings, together with those of Hopkin, indicate that investment requirements per head of cattle fed are greatly affected by the degree of mechanization of feedlots and by the level of utilization of the facilities.

^{33/} See Table XXIV in Appendix.

^{34/} Rex Helfinstine, Equipment Costs for Different Size Feedlots, F. S. 59, Cooperative Extension Service, South Dakota State College, Brookings, 1961.

Non-Feed Costs

Non-feed costs associated with the six feedlots examined included charges for interest and depreciation, cost of repairs, taxes, veterinary services and medicines, fuel and power, bedding, death losses, insurance, marketing, and miscellaneous other costs. Not included in the non-feed costs were interest on cattle and feeds. This item varied a great deal as prices varied among regions.

Non-feed costs for the four groups of California feedlots were found to be \$16.68, \$13.17, \$12.17 and \$10.69.^{35/} They decreased as the lots increased in size and as the number of cattle fed increased. Hopkin attributed some of the decreases in non-feed costs to higher feeding ratios, but he found other reasons for costs decreases too. In large feedlots labor specialization was possible and expensive mechanical equipment became economical. Costs per head were reduced with these added inputs.

The non-feed costs for the three types of feedlots in Arizona were \$9.62, \$12.90, and \$16.06 per head.^{36/} The lower figure was for those lots feeding silage where the investment requirement was only \$24.56. Costs for the lots feeding dry feed and green chop were similar to those for the California feedlots. Depreciation, repairs, taxes, and interest were the largest cost items.

^{35/} John Hopkin, op. cit.

^{36/} Leo J. Moran, op. cit.

Non-feed costs for the co-operative feedlot budgeted for South Dakota compared favorably with those presented for California and Arizona.^{37/} They amounted to \$13.13 and they could be reduced with a higher level of utilization of the plant and facilities.

Non-feed costs items for the farm feedlots were similar to those of the large commercial lots with the exception of a charge for labor. These were supplementary enterprises that utilized under-employed farm labor which had little or no opportunity cost. No charge for labor was included for any feedlot.

The non-feed costs for the typical farm feedlots in west Texas were \$14.35 and \$11.72.^{38/} These were surprisingly low costs for lots with relatively high investment requirements, but it was found that the depreciation charges were based on 25-50 year lifetimes for equipment and machinery. This charge was then comparatively low. Other costs may have been conservatively estimated too. It is interesting to note however, that the amount of non-feed costs were found to be lower in the large feedlot.

Non-feed costs reported for the two typical farm feedlots in Washington were \$12.80 and \$21.52.^{39/} The effects of size and utilization are evident here with costs of all items except veterinary services being lower for the large lot.

^{37/} See Table XXIII in Appendix.

^{38/} Magee, Marian, Fisher and Hughes, op. cit.

^{39/} Jay Swanson, op. cit.

In Montana, non-feed costs for the five categories of feedlots ranged downward from \$18.47 to \$7.79.^{40/} Again, all items cost less per head as more cattle were fed.

The non-feed costs for all farm feedlots varied from \$21.52 to \$7.79 with a \$10.00 to \$12.00 cost being fairly typical. Organization and use of the feedlot were important to the non-feed costs. High levels of utilization were found to contribute to reduced per head costs.

In a special Montana study of the economics of size of feedlots, the effects of size and utilization of feedlots were examined.^{41/} A summary of some of the work is shown in Table XVII. In this study, 55 feedlots were surveyed and data relative to the organization and operation of the lots were obtained. These data were used to describe average feedlots in four size groups. The average feedlots were then reorganized through the preparation of several budgets to show the effects of increased utilization of plants and facilities and the consequences of additions to equipment of feed processing mills, power box feeders, and other machines and equipment. The data in Table XVII show how investment requirements and non-feed costs changed, first as the number of cattle fed increased, and second as equipment was added which would process the feed and mechanize the operation.

^{40/} See Table XXIV in Appendix.

^{41/} Robert Mueller, Economies of Size in Farm Feedlots in Montana, unpublished thesis, Agricultural Economics Department, Montana State College, Bozeman, 1962.

TABLE XVII. INVESTMENT REQUIREMENTS AND NON-FEED COSTS, FARM FEEDLOTS, GROUPED BY SIZE OF FEEDLOT, MONTANA, 1961.*

	1	1A ^{a/}	1B ^{b/}	2	2A ^{a/}	2B ^{b/}	3	3A ^{a/}	3B ^{b/}	4	4A ^{a/}
CHARACTERISTICS											
Average number of cattle fed annually	45	90	90	120	175	175	240	640	640	450	1,040
Average capacity of feedlot	90	90	90	175	175	175	320	320	320	520	520
Ratio of number fed to capacity	.50	1.0	1.0	.68	1.0	1.0	.75	2.0	2.0	.87	2.0
Number of days feedlot operated	210	210	210	220	220	220	210	365	365	275	365
Kind of cattle fed	Calves	Calves	Calves	Calves and Yearlings	Calves	Calves	Calves and Yearlings	Calves and Yearlings	Calves and Yearlings	Calves and Yearlings	Yearlings
INVESTMENT PER HEAD IN FACILITIES											
Corrals, bunks and feeders	\$15.78	\$ 7.89	\$ 7.89	\$ 7.89	\$ 5.41	\$ 5.41	\$ 7.29	\$ 2.73	\$ 2.73	\$ 5.63	\$ 2.44
Feed processing equipment	---	---	8.88	---	---	8.57	---	---	3.90	4.69	2.03
Automatic waterer	2.00	1.00	1.00	1.50	1.03	1.03	1.50	.56	.56	1.20	.52
Squeeze chute	5.96	2.98	2.98	2.28	1.56	1.56	1.12	.42	.42	.60	.26
Machinery and equipment	---	---	---	22.53	15.46	15.45	24.29	9.11	9.11	14.18	6.14
Silo	---	---	---	1.98	1.36	1.36	1.16	.44	.44	1.50	.65
Total	\$23.74	\$11.87	\$23.06	\$36.18	\$24.81	\$33.38	\$35.36	\$13.26	\$17.16	\$27.80	\$12.04
NON-FEED COSTS PER HEAD											
Labor	---	---	---	---	---	---	\$ 1.37	\$ 1.37	---	---	\$.43
Death loss	\$ 2.46	\$ 1.23	\$ 1.23	\$ 1.73	\$ 1.18	\$ 1.18	1.20	1.19	\$ 1.19	\$ 1.08	1.08
Machinery repair and maintenance	1.56	.78	.96	1.67	1.14	1.31	.85	.62	.70	.77	.55
Gas and oil	1.71	1.30	1.30	1.83	1.54	1.54	1.46	1.00	1.00	.97	.67
Electricity	1.07	.53	.64	.43	.30	.35	.46	.17	.20	.31	.35
Veterinary and medicine	1.20	1.20	1.20	.75	.75	.75	1.37	1.38	1.38	.89	.89
Bedding	2.44	2.44	2.44	2.29	2.29	2.29	2.08	1.08	1.08	1.47	1.48
Marketing costs	.47	.47	.47	3.51	3.51	3.51	3.91	3.91	3.91	3.47	3.47
Depreciation	1.40	.70	1.23	2.53	1.73	2.25	2.33	.87	1.11	1.75	.76
Interest on equipment	.31	.16	.69	.52	.35	.87	.37	.14	.38	.43	.19
Insurance	---	---	---	---	---	---	.17	.07	.07	.21	.09
Taxes	1.00	1.00	1.00	1.04	1.04	1.04	1.04	.50	.50	1.26	.62
Miscellaneous	.84	.59	.59	.84	.66	.66	1.14	.69	.69	.60	.44
Total	\$14.46	\$10.40	\$11.75	\$17.14	\$14.49	\$15.75	\$17.87	\$12.99	\$12.21	\$13.21	\$11.02

* Source: Robert Mueller, Economies of Size in Farm Feedlots in Montana, Agricultural Economics Department, Montana State College, Bozeman, Montana.

a/ Feedlot costs with increased level of utilization.

b/ Feedlot costs with added machinery and equipment.

In group one, investment requirements and non-feed costs were originally \$23.74 and \$14.46 respectively. When the lot was filled to capacity (alternative 1-A) investment per head was cut to \$11.87 and non-feed costs were reduced to \$10.40. When a dry rolling mill was added to save costs of \$416.00 for feed processing, investment increased to \$23.06 and non-feed costs to \$11.75. So non-feed costs increased slightly while a considerable reduction in feed costs was realized.

Data for feedlots in group 2 show a similar reduction in investment per head and in non-feed costs as cattle numbers were increased. The cost of feed processing was reduced by \$820.00 with the addition of a dry rolling mill while non-feed costs rose only \$1.26.

In group three, non-feed costs were reduced by almost \$5.00 per head as cattle numbers were increased and year-around feeding was introduced. The addition of a dry rolling mill eliminated a feed processing cost of \$3,000.00, and a power box for feeding eliminated the need for hired labor in the feedlot operation. Non-feed costs were actually reduced by the added investments in machinery and equipment.

In group four, the feedlots were adequately mechanized and it was necessary only to increase the utilization of the feedlot facilities. The increase in numbers of cattle fed cut non-feed costs about \$1.20 per head.

These data provide some indication of what investment requirements and non-feed costs have been and are likely to be in the near future. They show how numbers of cattle fed and mechanization affect investments and costs, and so they are indicative of how efficiencies in feeding operations can be realized.

Feed Costs

Data relative to the costs of feed were available in greater quantities and from more states than were those relative to investments and non-feed costs. A good deal of work has been done by animal nutritionists on feed and rations, and the economists in the cattle feeding states have accumulated information about feed costs from farm records and miscellaneous studies.

Costs of cattle and feeds in Illinois, Nebraska, Texas, Utah, Washington, South Dakota and Montana were accumulated and compared. The data represented the feeding period 1959-60 in most cases.

In Illinois, costs of feed for various systems of feeding all of which utilized a liberal grain ration varied from a low of \$16.15 per one hundred pounds of gain for steer calves to \$19.44 per one hundred pounds of gain for two-year-old steers.^{42/} Costs for feeding steers were found to be higher than the costs for feeding calves.

^{42/} Feeder Cattle Guide, Extension Circular 3579, and Twenty Second Annual Report of Feeder Cattle, Experiment Station Mimeo, University of Illinois, Urbana, 1960.

Seven of the eight systems of feeding reported for Nebraska utilized a liberal grain rations.^{43/} Feed costs per one hundred pounds of gain ranged from a low of \$13.10 for calves to \$17.44 for two-year-old steers. The one ration which contained a liberal quantity of silage was fed to yearling steers and the feed cost was \$14.98.

Six systems of feeding were reported for Texas--three with liberal grain and three with liberal roughage.^{44/} Grain sorghums were the chief grains used and sorghum silage was the principal roughage. The liberal roughage rations were found to be more costly. When fed to steers, they were \$16.77 per one hundred pounds of gain while the liberal grain ration was \$15.14. Steers on roughage did not gain as much.

In Utah, feed costs for calves, yearlings, and two-year-old steers ranged from \$14.29 to \$20.25 per one hundred pounds of gain.^{45/} All were fed a liberal grain ration.

A liberal barley ration fed to steers in Washington was less costly per 100 pounds gained than were the rations for calves fed

^{43/} Nebraska Livestock and Feed Roundup 1960-61, Extension Circular 60-808, Cooperative Extension Service, University of Nebraska, Lincoln.

^{44/} Magee, Marian, Fisher and Hughes, op. cit.

^{45/} Lynn H. Davis, Feedlot Fattening of Cattle in Utah, 1953-54, Bulletin 380, Agricultural Experiment Station, Utah State University, Logan, 1956. Price data for 1960 obtained from Agricultural estimates Division, Agricultural Marketing Service, United States Department of Agriculture, Salt Lake City, Utah.

barley or steers fed corn.^{46/} Feed costs ranged from \$15.87 to \$18.36 per 100 pounds of gain.

Costs of feed for calves, yearlings and heavier steers fed in South Dakota ranged from \$13.02 per one hundred pounds of gain for yearlings fed liberal roughage to \$17.24 for two-year-old steers fed liberal grain.^{47/} The range in feed costs here is similar to those found for other states.

Feed costs for nine systems of cattle feeding in Montana varied from a low of \$10.83 per one hundred pounds of gain for steer calves to \$15.40 for two-year-old steers.^{48/} All rations utilized liberal amounts of grain, and barley was the principal grain fed.

It is evident that a great number of rations and feeding systems have been employed to feed several classes of cattle in the various states where cattle are fed. Each of the systems are appropriate to local conditions, and the rations are compounded according to feeds that are available. Costs are unique to the systems and rations used within systems and are difficult if not impossible to compare with accuracy.

^{46/} J. B. Wyckoff, Cattle Feeding in the Columbia Basin, Circular 357, Agricultural Experiment Station, Washington State University, Pullman, 1960.

^{47/} See Table XXV in Appendix.

^{48/} See Table XXVI in Appendix.

Feed costs for cattle fed in Montana and South Dakota do not appear to be any higher than they are in other states; however this conclusion is based on the research cited and can be no more inclusive than permitted by the data available.

Because the cost of cattle and feed are so important to the success of feeding operations, prices of various feeds used and prices of cattle fed have been accumulated for a five-year period, 1956-60. They are usable for comparative purposes when account is taken of feeding values of feed and grades and weights of cattle.

Feed Prices

Feed grain prices for corn, oats, barley and grain sorghums were accumulated for Montana, North Dakota, South Dakota and for seven important cattle feeding states outside Region 1.^{49/} It was found that prices in the Northern Great Plains have been relatively low for each of the four feed grains. Corn prices in North Dakota and South Dakota were below those in the Corn Belt for the 1956-60 period. Barley and oats were priced lower in all three states of the region than in the other seven states. Grain sorghums were produced in only one state in Region 1, South Dakota, and they were priced below those sold in southern states.

In the midwestern or corn belt states, feed grain prices were generally above those which prevailed in the Northern Great Plains

^{49/} See Table XXVII in Appendix.

and below those found in the West and Southwest. Corn, the most important feed grain produced in these states, was priced above corn in North Dakota and South Dakota in every year of the five-year period.

In Colorado, prices of barley and grain sorghums were relatively low. Cattle feeders in that state have had ready access to corn, barley and grain sorghums and they have also been able to use available supplies of silage and sugar beet by-products.

Prices of the four feed grains in Texas have been relatively high, but sorghum production has been increased recently and prices of this grain have been falling.

Feed grains have been comparatively expensive in Arizona. Two-thirds of the cattle feeders in Arizona feed silage; however, some minimum amount of grain must be used in the fattening rations and much of what is used must be imported.

Feed grain prices have also been high in California. Silage, citrus by-products and other feeds have been used to supplement grain; however barley and grain sorghums have been used in large quantities by California feeders. Much of it is imported.

The differences in feed grain prices among the ten states studied have been largely a consequence of transportation costs for grain moved.^{50/} Region 1 has exported large quantities of barley and corn and much of their exports have gone to the West, South, and Southwest.

^{50/} See Tables XXVIII and XXIX in Appendix.

It was previously noted that corn exported from the Corn Belt moved largely to the South and Southwest. These movements have required that transportation costs be incurred, and as a result feed grain prices were higher in importing states in the South and Southwest.

Prices for hay and supplements were also accumulated for the ten states since they are important components of cattle feeding rations.^{51/}

Prices for hay have been relatively low in North Dakota and South Dakota and high in Montana. Hay prices in the Corn Belt were between those for the Northern Great Plains states and the Southwestern states. Hay was relatively high priced in Arizona and California. Hay does not move long distances as do the feed grains because it is bulky and costly to transport. Prices are largely a function of supply and demand conditions at local levels and fluctuate as these conditions change.

The supplements were priced lowest in states where they were produced and highest in those states which were farthest from points of production. Thus cottonseed meal was relatively low priced in Texas and Arizona and higher priced in the northern states. Soybean meal was priced lowest in the Corn Belt states and highest in Arizona and California. The higher prices reflect costs of movement of these supplements to areas outside of those where the products are

^{51/} See Table XXVII in Appendix.

compounded. Transportation costs have made the supplements relatively expensive in Montana, North Dakota and South Dakota.

Differences in prices of feed grains within any of these states (and exclusive of transportation costs) may also be found. Corn has been priced above the other feed grains in most cases; oats has been priced close to corn except in North Dakota and Montana; and barley and grain sorghum prices have been about equal for the period and below corn and oats. With the exception of oats, these price differences reflect nutritive values of grains, with barley and grain sorghums about 96 and 92 percent of corn respectively. The oats price has been influenced by other factors. The nutritive value of oats has been about 85-87 percent of corn, which makes it worth less per pound than barley or grain sorghums in so far as nutrition is concerned. But oats have peculiar properties which make them a good livestock feed for certain purposes. A relatively strong demand for this grain has caused the price to hold steady, while prices for other feed grains have declined. So the prices for the 1956-60 period reflect nutritive and other feeding values, and corn and oats have been found to be most costly.

The price data indicates that cattle feeders in the Northern Great Plains have experienced some advantage in the purchase and use of feed grains and hay. The advantage may have been greater or less in areas within Region 1, but it appears to have existed in the 1956-60 period.

It also seems likely that this advantage may persist in the future. Feed grain production in Region 1 is expected to exceed utilization by

50 percent or more in 1965 and 1975, and large quantities of grain will be exported from the region.^{52/} The feed grains exported will probably be utilized in regions south and southwest of Region 1 where cattle feeding is developing at a rapid pace. Prices in states where the grains are fed will be higher than those in Region 1 by the amount of the transportation charges. Surpluses of feed grains in other exporting regions will likewise move to deficit production areas, but local prices in those exporting regions (such as the Corn Belt) will be higher than those in Region 1 because of lower transportation costs incurred in export.

With no pronounced shifts in feed production areas and with continued expansion of livestock feeding in the South, Southwest, and West, price relationships for feed grains should be such that feed grains will be relatively low priced in Region 1.

Feeder Cattle Prices

Prices of feeder cattle and calves were accumulated for 12 mid-western and western markets and compared.^{53/} These markets are located in areas where large numbers of cattle are produced and fed, and they represent many of the sources of supply for cattle feeders.

^{52/} See Tables XV and XVI.

^{53/} See Table XXX in Appendix.

While price differences among regions were found in the data, they are not large and do not appear as might have been expected. In some deficit cattle producing areas prices have been lower than those in areas where cattle were grown in surplus numbers. For example, prices in Phoenix and Ogden were below those in Billings. In other deficit producing areas, prices were higher than those in exporting areas. Chicago prices for feeders were generally above those for Billings and Sioux Falls. The explanation seems to lie in the kinds of markets which exist in the various regions and in their relative independence in so far as the establishments of prices is concerned.^{54/}

The midwest markets for cattle, into which many Northern Great Plains feeder cattle have moved, are fall markets. Cattle feeders in the Corn Belt are farmers who have large stocks of grain in the fall, and they annually seek one lot of cattle to fill their feedlots. They compete vigorously for northern feeder cattle of good quality, and a price is established which reflects a rather strong seasonal demand. Cattle feeders of the Southwest and on the Pacific Coast are relatively large operators who feed cattle the year-around and buy feeders continuously. Their supplies of cattle come out of the southern plains and Mexico, and they are generally light weight, lower quality feeders. The market prices in these areas reflect the different demand condi-

^{54/} For Data on rail freight rates for cattle and calves see Table XXXI in Appendix.

tions, and they appear to have been set at lower levels than prices in the Midwest.

If prices in Billings and Sioux Falls are compared with those in other markets, they can be seen to have been generally lower than those in Chicago and Omaha, about equal to those in Kansas City and Denver, and somewhat higher for most classes and grades of feeders than those in Phoenix, Portland, Spokane, Los Angeles, and Stockton. No particular cost advantage can be discerned for feeder-buyers in the Northern Great Plains for the five-year period, but the data are not sufficient for any definite conclusions. Relatively favorable prices may exist at particular times of the year or for specific grades or sexes of feeder cattle.

In the past, large numbers of feeder cattle have moved out of the Northern Great Plains states into the Corn Belt and other midwestern states for fattening. If the export of feeders to these other states should be reduced by virtue of increased cattle feeding in Region 1, prices would surely be affected. A smaller supply of cattle would cause competitive bidding for those available, and prices would be adjusted upward. This situation would probably prevail for only a short time however. Increasing numbers of feeder animals have been produced in the Midwest in recent years, and this production would undoubtedly pick up with higher cattle prices. Land diverted from cash crops would be utilized for cattle production and beef cattle enterprises would replace dairy and swine enterprises on many midwest

farms. In addition, cattle feeders would probably look to other sources of supply for feeders. Cattle production has been increasing rapidly in the South, and producers there would find their markets strengthened if the supply of northern cattle was reduced.

So it appears that an increase in cattle feeding in Region 1 would result in higher prices for feeder cattle in the short run, but the effect of a smaller export of feeders out of Montana, North Dakota and South Dakota would be offset by increased supplies of cattle in other regions.

Markets for Fed Cattle

Also of great importance to the competitive position of cattle feeders in the Northern Great Plains will be the markets for fed cattle. Feeders will be concerned with the size of their market outlets, their locations, the costs of marketing cattle in these outlets, and the market prices which will prevail. These factors will influence the profitability of cattle feeding enterprises just as surely as will the supplies and prices of feeds and feeder cattle. They must be given close attention in an analysis of prospects for cattle feeding in Region 1.

If circles of 500 and 1,000 mile radii are drawn around Billings and Sioux Falls, as in Figure 14, a measure of the potential markets for fed cattle produced in Region 1 can be obtained. This can be only a rough measure of possible outlets, but it does show where markets now exist in relation to areas of production of fed cattle in Region 1.

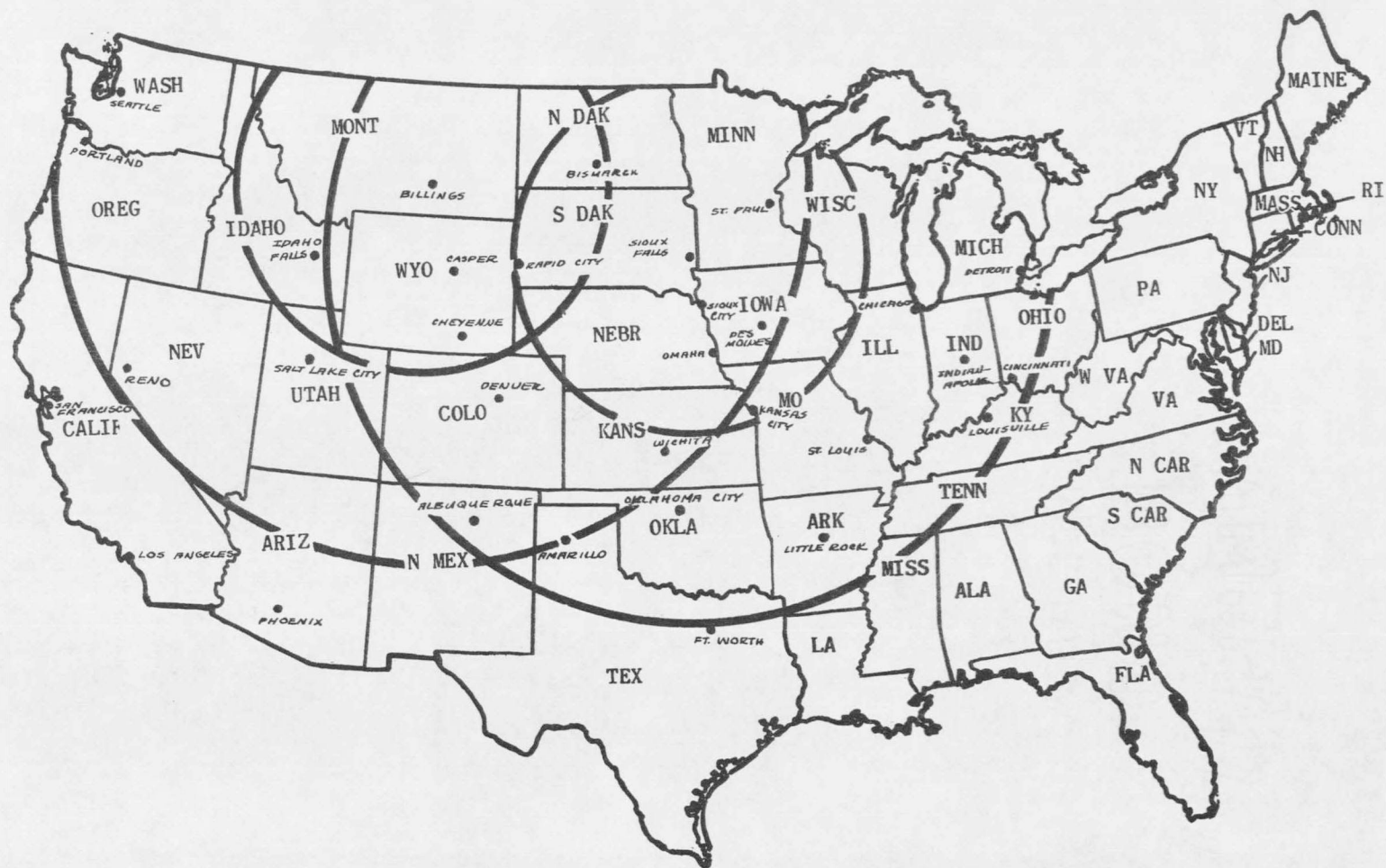


Figure 14: Markets for Fed Cattle Within 500 and 1000 Miles of Billings and Sioux Falls

Within the 500-mile circle around Billings there are only a few cities of limited size. These include Great Falls, Idaho Falls, Casper, Cheyenne, Rapid City, and Bismark. None of these are large enough to be important consuming areas, and the markets in and near these cities have been relatively unimportant in terms of cattle received and sold.

Within this 500-mile circle are located ten federally inspected slaughter facilities. None of them are very large and they do business largely within local territories. They can serve as the basis for an enlarged and developed packing industry in the northern intermountain states, but then they would come into competition with the major packing firms.

Within a 1,000-mile circle around Billings there are located a few large cities and several additional smaller ones. Included are Seattle, Portland, Salt Lake City, Reno, Denver, Omaha, Sioux City, Fargo, Minneapolis, and St. Paul. These are cities which are sufficiently large to be important areas of consumption, and they must be considered as potential markets. All these large cities have important public or auction markets which handle significant numbers of fed cattle.

Within this 1,000-mile circle are more than 100 federally inspected slaughter plants. Some are clustered around Seattle, Portland, Denver, Sioux City, Omaha, and St. Paul and the rest are scattered around in the circle and are located in smaller cities. A considerable number of slaughter plants in the circle are located in Iowa, Minnesota, eastern Nebraska and northern Missouri. These facilities are within or adjacent

to the Corn Belt, and so draw cattle for slaughter both from the East and West.

A 500-mile circle drawn around Sioux Falls reaches no farther west than Montana and Wyoming, but east almost to Chicago. In this area are found several large cities including Fargo, Rapid City, Sioux Falls, Sioux City, Omaha, Des Moines, Kansas City, Cedar Rapids, Minneapolis and St. Paul. They constitute important areas for consumption and must be regarded as potential markets for cattle fattened in the eastern part of Region 1.

In this 500-mile circle are many of the important federally inspected slaughter facilities of the western Corn Belt. These would tend to make the market stable and reliable, but they would also draw cattle out of midwestern states.

A 1,000-mile circle around Sioux Falls encompasses most of the states in the central United States. It includes such large cities and important consuming centers as Denver, Kansas City, Oklahoma City, St. Louis, Louisville, Indianapolis, Cincinnati, Chicago, and Detroit, and many smaller cities fall within the boundaries of the circle. These centers of population are important consuming areas and they support rather extensive markets for fed cattle and beef. The market area surrounding Sioux Falls is thus larger in some respects than is that around Billings.

The 500 and 1,000-mile circles around Billings and Sioux Falls, thus serve to indicate the possible outlets for fed cattle produced in

Region 1. Cattle markets located within these circles are a reasonable distance from the three Northern Great Plains states, and some of them may be considered as potential markets for cattle from Region 1. But they need to be given further consideration in order to discover the markets which offer the greatest prospects for development.

In the eastern portions of the circles are the large centers of population, the important consuming areas of the Midwest. Here are found the larger markets for fed cattle and the most numerous facilities for slaughter. For some areas within Region 1 these markets have been outlets for fed cattle. But some real limits to the participation of Region 1 cattle feeders in these markets are evident and they should be recognized.

Beef for midwestern consumers have traditionally been supplied by corn belt cattle feeders. The markets have served these producers, and packers have obtained their supplies of slaughter animals from these markets. Feeders in Iowa, Illinois, Missouri, Minnesota, Indiana, and Ohio will continue to produce large supplies of fed cattle, and they will offer stiff competition to entrants into their markets. Many cattle feeders in Region 1 are located from 500 to 1,000 miles from these midwestern markets and would have to incur relatively high transportation costs to put fed cattle into them. To compete they would have to overcome this locational disadvantage, and this would seem to be a difficult job. It appears that the cattle feeders in eastern South Dakota would have the greatest opportunity to share in these midwestern markets.

In the southern reaches of the circle can be found a rapidly developing cattle feeding industry. In the south central states, both feed grains and cattle have been produced in increasing numbers in recent years, and they are being combined as feeding enterprises develop. The output of fed cattle now largely satisfies the requirements of local packers and consumer markets, and the cattle feeders are looking westward for markets for fed cattle. It will be difficult for feeders in the Northern Great Plains to invade these markets. Areas in the Northern Great Plains where cattle are or will be fed are 500 to 1,000 miles from Denver, Kansas City, Oklahoma City, and other southern cities, and costs of transportation will put producers in Region 1 at a disadvantage hard to overcome.

The western states encompassed within the circles present quite different opportunities for the marketing of fed cattle. In these states and within 1,000 miles of Billings, are such important cities as Portland, Seattle, Spokane, Reno and Salt Lake City. Just beyond the circle are San Francisco, Los Angeles, and other large California cities. These centers of population have grown rapidly in recent years, and it is expected that they will continue to grow at rates greater than those for other cities in the United States. Populations of the coastal states will thus increase markedly by 1975, and markets for beef should be strong.

While cattle feeding has developed in California, Arizona, Washington, and Oregon, it has not been sufficient to supply the needs of

the developing coastal markets. It was pointed out that Los Angeles packers have imported cattle from as far east as Texas, Colorado, Wyoming, and Montana, and it is known that two packers in Montana ship dressed beef to California regularly. It appears that a real opportunity to develop west coast markets exists, and it is these markets that will interest many Northern Great Plains cattle feeders.^{55/}

Costs of Marketing

Costs of marketing fed cattle produced in Region 1 will depend on (1) the kinds of market outlets which will be available, (2) the costs of transporting cattle to these markets and, (3) the specific marketing costs associated with the various possible outlets. These costs will vary within the region but they can be generally identified and summed up.

Two kinds of market outlets which will be important to producers of fed cattle in Region 1 are (1) the terminal or auction markets in the central and western states which handle fed cattle, and (2) the packers within the same area who slaughter significant numbers of cattle. These outlets are to be found in the larger cities in the central and western states, as noted in the previous discussion of potential markets for fed cattle. They will play an important role in the development of cattle feeding in Montana, North Dakota and South Dakota.

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See Table XXXII in Appendix for estimates of beef consumption in eleven western states, 1970.

The relative importance of the terminal and auction markets and the packer-buyer outlets for fed cattle will depend on the effectiveness with which cattle can be marketed in these outlets. Terminal and auction markets are fairly well established in Region 1 with markets now located in such cities as Billings, Great Falls, Bismark, Fargo, Rapid City and Sioux Falls. Outside the Region are important markets in Sioux City, Omaha, St. Paul, Spokane, Portland, and Seattle. These will surely continue to handle fed cattle from Region 1. But packer-buyer outlets may become more important to producers of fed cattle, especially if considerable growth is realized in the packing industry in Montana, North Dakota and South Dakota.

Rust and Harston, Montana State College Economists who are now studying the packing industry in Montana, presently anticipate a somewhat limited development of meat packing in the state.^{56/} There were four federally inspected packers in Montana in 1960, all of whom shipped some beef out of the region.^{57/} They now have excess capacity in their plants which could be utilized in increased slaughter of cattle. The limitations for these firms seem to be in market development. When a larger share of markets outside Region 1 is sought, Montana packers come into competition with large packers who do

^{56/} Report to be available December, 1962.

^{57/} United States Department of Agriculture, Number of Livestock Slaughter Plants, Mt. An. 1-2-2 (60) Crop Reporting Board, Agricultural Marketing Service, Washington, D. C.

business interregionally. The smaller firms have difficulty in competing effectively and so they do not attempt to participate in the more distant markets on a large scale. But if these firms could develop adequate size, so that they could supply large quantities of beef to grocery chains and other big buyers, they might become quite competitive. There are some prospects for such a development.

There were no federally inspected slaughter establishments in North Dakota in 1960. Ten state inspected plants slaughtered cattle and calves, but none of them produced a very large quantity of beef. With a further development of cattle feeding in the state, some of these plants will undoubtedly expand their operations. With federal inspection they could market beef outside North Dakota, and probably some would be inclined to do so. But it seems likely that such expansion among these plants will await increased cattle feeding activity.

In South Dakota, there were five federally inspected plants in 1960 which slaughtered cattle and calves. Three of the major packers have plants in that state, and all of the federally-inspected plants have handled relatively large numbers of cattle. These packers have been important outlets for fed cattle producers in South Dakota. They have purchased some of their supplies of slaughter stock direct from feeders, and they have been active buyers in Sioux Falls markets. The meat packing industry has developed to a greater extent in South

Dakota than any other state in the Northern Great Plains. Prospects for further growth seem to be good.

Costs of marketing exclusive of transportation costs are composed of charges for facilities and services at terminal and auction markets, and the various costs associated with direct marketing.

At the public terminal market, charges are made for five kinds of service--yardage, feed, bedding, unloading and loading and other services. Commission agents handle livestock consigned to them. They sell the stock, collect the proceeds from the buyer, deduct their charges and the stockyard charges, and remit the net proceeds to the seller. Average marketing costs for initial sales at terminal markets in the United States have been \$2.33.^{58/}

Operators of auction markets levy their charges on the percentage of gross value, or on a per head basis, or by combination of the two methods. More auctions use the straight charge per head method to compute the charges than any other method. Average charges in auction markets have been about \$2.25.

While packers obtain their supplies of cattle from many sources, many of them maintain staffs of salaried livestock buyers who travel throughout the country and buy cattle and other livestock at feedlots, farms and ranches. When sales of fed cattle are negotiated at the farmer feedlot, there may be a shrinkage allowance involved in the

^{58/} United States Department of Agriculture, Marketing Margins and Costs for Livestock and Meats, Marketing Research Report No. 418, Agricultural Marketing Service, Washington, D. C.

purchase agreement. These vary from one to five percent of live weight and are definitely a cost of marketing. If cattle are weighed away from the feedlot there may also be transportation and yardage charges incurred. These allowances are usually negotiated as part of the selling price. They can be quite significant costs of selling fed cattle.

Transportation costs for fed cattle depend upon the mode of transportation and the distance they are moved. The costs include the direct charges for hauling animals and the shrinkage involved in the movement from farm to market. When cattle are moved long distances, the cost can be quite significant.

Increasing numbers of fed cattle have been moved to terminal and auction markets or slaughter establishments by truck. This has oftentimes been a cheaper and more convenient way to transport these cattle than has movement by rail, and many trucking firms have been organized for the express purpose of hauling livestock. While truck rates have been reported to be cheaper in many cases than railroad rates, no data were available to show what the usual or customary rates have been.

Rail rates for transporting fed cattle were assembled from the railroads and are indicative of the cost of transport.^{59/} It was found that cattle fattened in the western half of Region 1 and sold in any of the western or midwestern markets, except for the Billings market, incurred transportation costs of a little more than \$1.00 per

^{59/} See Table XXXIII in Appendix.

hundred-weight. If they go to Sioux Falls, Sioux City, Omaha or St. Paul the charges are about \$1.00 to \$1.25. If they move west to Spokane, Portland, or Seattle slightly higher charges must be paid. In addition there will be shrinkage on cattle shipped almost 1,000 miles to these markets which could amount to as much as 10 percent on arrival at destination. This cost can be reduced by fill-back, but it is an important marketing cost.

Cattle fattened in feedlots in the eastern half of the region can be marketed at St. Paul, Sioux Falls, Sioux City, Omaha, and other important markets with smaller costs for transportation and shrinkage. There may be little or no transportation cost disadvantage, so that these cattle are equally competitive with those out of Nebraska, Iowa, and adjacent cattle feeding areas. Thus cattle feeders in the eastern half of Region 1 will have some advantage over their western neighbors.

A further consideration in the marketing of cattle out of the western portion of Region 1 is the locations of coastal and northwestern markets in relation to Region 1 and other areas where cattle are fed. Freight rates from Billings to Spokane, Portland and Seattle are \$1.08 to \$1.39. Rates from all other areas which might ship to these points are higher, with the exception of Idaho Falls. These three cities are importers of cattle and beef, and prospective high rates of population growth make them look good as future outlets for fed cattle and beef. Cattle feeding is expected to develop further in Oregon and Washington, but there should be opportunities for Region 1 cattle feeders

and packers to develop these markets and to claim an important share of them. So while marketing costs may be fairly high, they do not appear to be higher than those for cattle producers in other western areas who would ship cattle to the Northwest.

Prices for Fed Cattle

Prices for fed cattle in the various markets in and outside of Region 1 will also influence the development of cattle feeding in the Northern Great Plains.

Market prices for slaughter cattle in 12 western and midwestern markets were accumulated for the 1956-60 period and examined. These 12 markets represent most of the larger cattle markets in which cattle from Region 1 could be placed.^{60/}

In the 1956-60 period the highest prices for slaughter cattle were paid in Chicago. Average prices there were about \$2.00 above those for Billings. Other markets which paid relatively high prices for slaughter cattle included Los Angeles, Stockton, Portland, and Kansas City. In the middle of the range of prices paid were markets at Denver, Omaha, and Phoenix. Lower prices for the five-year period were found in the Billings, Ogden, and Spokane markets. Quotations from Sioux Falls were available for only three years, but the prices paid in that market seem to be above Billings and below Omaha prices.

^{60/} See Table XXXIV in Appendix.

These price relationships are logical and explainable when the factors affecting prices in different markets are examined. In a large market area, such as the Chicago area, surplus supplies of cattle are available and numerous large packers are present which supply the beef needs of important consuming centers all over the United States. Prices for fed cattle are based on wholesale beef prices in such consuming centers as New York, St. Louis, and Los Angeles, less processing, transportation and merchandising costs incurred in selling beef in these places. In a small market area, such as the Billings area, relatively small supplies of cattle are available and few packers are present who supply the need for beef in a local trade territory. Prices for fed cattle are determined largely by supply and demand within the area, and they fall within a range of prices which is made up of fed cattle prices in large market areas, plus or minus the costs of shipping fed cattle into or out of the small market area. Thus any surplus of cattle tends to depress the price, and a deficit causes the price to move toward the upper limit of the range. In actual practice an on-balance condition often yields a price for fed cattle below the large market price, less transportation, because of the monopsony position of the cattle buyers.

Chicago has been an important market for slaughter cattle as it is adjacent to the Corn Belt where large numbers of fed cattle are produced, and it is located within an area of relatively dense population. Dressed beef is shipped out of Chicago to many large midwestern

and eastern cities. The demand for slaughter animals is strong and the prices have been good.

The west coast markets--Portland, Los Angeles and Stockton--have become quite important in recent years because of the growing demand for beef occasioned by a rapidly expanding population. Slaughter has gone up and fed cattle have been drawn into the coastal states from all the western producing areas. Prices have been relatively high but below the Chicago prices. Prices for slaughter cattle in Billings and Sioux Falls have been influenced by the locations of the markets with respect to the important consuming centers in the Midwest and West. It has been pointed out that Billings is 500-1,000 miles from large metropolitan areas. While Sioux Falls is more advantageously located, it too is outside the densely populated areas. This means that fed cattle not slaughtered and consumed within Region 1 must either be moved to packer outlets in other regions or slaughtered and shipped as dressed beef to wholesalers and retailers in other regions. Either method of disposition requires that a transportation cost be incurred, and the market prices reflect this cost.

Looking ahead to 1975, it is difficult to foresee any marked deviations from the level of slaughter cattle prices which has prevailed in recent years. Some persons have been concerned about a glut of cattle which might accompany large increases in supplies of feed grains, but the experience with feed grain control programs so far is indicative of our ability to control feed surpluses and thus to limit

beef production to reasonable levels of output. Cattle production and feeding will almost certainly expand, but so will the population increase and per capita consumption go up. It seems reasonable to presume that cattle and beef production will develop at a rate approximating the increase in demand for meat, and that slaughter cattle prices will hold steady with some cyclical changes as in the past.

PART III

SUMMARY AND CONCLUSIONS

The analysis of the competitive position of cattle feeders in the Northern Great Plains shows that there are some factors and conditions which work to the advantage of Northern Great Plains cattle feeders and that there are some that operate to their disadvantage. A brief review of the factors follows.

(1) Data concerning costs of cattle feeding were indicative of some cost advantage which might be exploited. Feed grains are relatively low priced in Montana, North Dakota, and South Dakota, and feeder cattle are no more costly in Region 1 than in other cattle feeding areas. It is expected that prices for feed grains in the Northern Great Plains will continue to be lower than those in the Midwest, South and West, and no significant increases in price levels are anticipated.

(2) Feeder cattle prices might rise if exports to other regions are reduced, but this would be a temporary effect if cattle production in the Midwest and South developed rapidly as a consequence of higher prices.

(3) Other costs for feedlot operations in Region 1 appear to be similar to those in other regions when comparable enterprises are compared. No data were available for large feedlots, so comparisons could not be made with large scale operations in Colorado, Arizona, and California. But a budget

for a 5,000 head cooperative lot in South Dakota shows prospective costs competitive with these established enterprises.

(4) There appear to be some real opportunities for cost reductions in existing feedlots in Region 1. Increases in size and better utilization of plants and facilities will reduce per head costs and make cattle feeders in Region 1 even more competitive. These economies would increase the likelihood of rapid, substantial development of cattle feeding.

(5) The analysis reveals more clearly the opportunity for marketing fed cattle in the growing western markets. These markets are increasing in size as population grows, and more fed cattle are needed to meet consumer demands for beef.

Cattle are now being imported for slaughter from several of the intermountain and southwestern states. While the costs of marketing cattle fed in the Northern Great Plains and shipped to the coastal markets are rather high, they do not appear to exceed costs associated with marketing fed cattle from most other western feeding areas. Feeders in the western part of Region 1 should be able to compete in these markets, particularly in those located in the northwestern states.

(6) A condition which will limit the competitiveness of cattle feeders in Region 1 is the typical seasonality of feeder and fat cattle production and marketing. Most slaughter operations are now predicated on a regular and continuing supply of

high quality fed cattle. Cattle feeding in Montana, North Dakota, and South Dakota is not now organized so that it can deliver fed cattle on such a basis. Region 1 feeders are thus at a disadvantage. The solution to this problem depends on better organization of cattle production and feeding activities, with much more year-around feeding in farm and commercial feedlots. Most existing feedlots will have to expand their operations, and some new large scale enterprises are needed.

(7) While an opportunity to participate in the western market is foreseen, outlets for fed cattle may still prove to be problematic in the development of cattle feeding in Region 1. To the east of the region is the Corn Belt, where large numbers of fed cattle are annually produced; and to the south is the grain sorghum producing states, where a cattle feeding industry is rapidly developing. Cattle feeders in these areas will offer stiff competition in those markets where they sell slaughter stock. They will certainly protect their share of the midwestern and eastern markets, and some of them will be looking to the west coast markets too. Northern Great Plains feeders cannot be said to be advantageously located with regard to markets, with the possible exception of those in the Northwest. They will have to compete rigorously in the outlets for cattle open to them.

(8) An unknown factor in the Northern Great Plains cattle industry is the extent to which the packing industry will develop. If existing packers should expand, or if the bigger companies should open new facilities, outlets not now available to cattle feeders would be created. Such a development would be of great importance to cattle feeders, and it would undoubtedly cause a rapid expansion in cattle feeding enterprises. The actions of the packers should be watched carefully because they are an integral part of the beef cattle industry of Region 1 and they may be the important link to inter-regional markets which is needed for maximum development of cattle feeding.

(9) Estimates of production of feed and feeder cattle in Region 1 by 1975 indicate that an output of fed cattle amounting to more than three million head would be possible with 100 percent utilization of those feeder cattle. Only 30 percent of the feed grains produced would be required to feed this number of cattle, leaving a large part of the grain produced to be otherwise utilized. The potential for expansion is thus about 440 percent of the average production of fed cattle for the 1956-60 period.

(10) With a rapidly expanding population and moderate increases in per capita consumption of beef, the demand for fed cattle and beef will be significantly increased by 1975.

Opportunities for increased marketing of fed cattle will exist, and expansion of feeding activities will certainly take place in many areas as feeders attempt to exploit these opportunities. There is a distinct possibility that cattle feeders in the Northern Great Plains can claim a share of these expanded markets.

The observations made in this study have led to the conclusion that cattle feeding will be increased in the Northern Great Plains so that by 1975 up to 1.5 million cattle will be placed on feed annually. This is about double the number fed on an average in the 1956-60 period. It represents about 50 percent of the feeder cattle that will be produced in Region 1 in 1975, in contrast to a level of utilization of 30 percent in 1956-60. It seems unlikely that greater numbers of fed cattle will be produced, but 1.5 million fed cattle is a real possibility.

To achieve the 1975 level of output some reorganization of cattle feeding operations must take place. Many existing feeding enterprises will be expanded in size and they will operate on a year-around basis. Some new, large-scale feedlots will also be constructed in strategic locations and they will add considerably to annual output. Feedlots will generally range in size from 500 to 5,000-head capacity, with some lots capable of handling 10,000 to 20,000 head. It is not expected that extremely large feedlots such as those found in California will be developed. The feedlots that will exist will be highly

mechanized, and efficiently operated. They will market fed cattle continuously, with a significant proportion of their sales being made to packer-buyers, and cattle will meet packer specifications as required.

As cattle feeding in the Northern Great Plains develops, some changes in the meat packing industry of the region can be expected. In the next 10 to 15 years existing packers will surely attempt to expand their operations and to claim bigger shares of the markets for beef outside the region. Some at least, will be successful. There is a distinct possibility that new firms may also locate in Montana, North Dakota, and South Dakota, and that one or more of the bigger packers may establish plants within this region. Further development of meat packing is uncertain, and prospects need to be examined.

Because there are numerous and diverse factors which will affect the development of cattle feeding in the Northern Great Plains, this study of the prospects for development cannot end with the above conclusions. The technology of beef production requires continuing observations and analysis, for it could change and seriously affect cattle feeding in the region. The economic factors affecting the production and consumption of beef could change unexpectedly too, causing changes in costs of or prices for beef.

Cattle feeders in Region 1 can be competitive in some, if not all, markets for fed cattle. There are some problems of organization and management of cattle producing enterprises which must be solved; there are some limitations to markets available to cattle feeders in Region 1;

and there is the ever-present problem of the cost price squeeze which must be faced. But there are resources in the region which are available for utilization in cattle feeding, and there are prospects for their profitable employment in feeding enterprises. The prospects for at least some continued development of cattle feeding seem to be good. Some cattle feeders, if not all, will profit from the development.

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APPENDIX

TABLE I. POPULATION OF THE UNITED STATES, SELECTED DATES 1900-1960.*

Year	Number of People		Increase	
	millions		millions	
1900	76.2			
1910	92.2		16.0	
1920	106.0		13.8	
1930	123.2		17.2	
1940	132.1		8.9	
1950	151.3		19.2	
1960	179.3		28.0	
<u>Projections^{a/}</u>				
	I	II	III	IV
1965	199.0	195.7	193.6	191.5
1970	219.5	213.8	208.2	202.5
1975	243.9	235.2	225.6	215.8
1980	272.6	260.2	245.4	230.8

Assumptions:

- I. Fertility rates 10 percent above present.
- II. Present fertility rates continue.
- III. Fertility level declines to 1949-51 level by 1967-70 and continues to 1975-80.
- IV. Fertility level declines to 1942-44 level by 1965-70 and continues to 1975-80

* Source: United States Department of Commerce, United States Census of Population, 1960, Bureau of the Census, Washington, D. C.

^{a/} United States Department of Commerce, Current Population Reports, Bureau of the Census, Washington, D. C., 1960.

TABLE II. PER CAPITA DISPOSABLE INCOME, SELECTED PERIODS 1929-1959.*

Date	Income	Increase
	dollars	dollars
1929	\$ 682	
1933	364	\$ 318
1940	576	212
1945	1,075	499
1950	1,369	294
1955	1,661	272
1959	1,891	230

Projection^{a/}

1975 2,449

Assumption: Population will grow to 220 million people.

* Source: United States Department of Commerce, Statistical Abstract of the United States, 1960, Bureau of the Census, Washington, D. C., 1961.

^{a/} Rex F. Daly, "The Long Run Demand for Farm Products", Agricultural Economics Research, Vol. VIII, United States Department of Agriculture, Washington, D. C., July, 1956.

TABLE III. PER CAPITA FOOD CONSUMPTION SELECTED PERIODS, 1925-1957.*

Item	Average 1925-29	Average 1935-39	Average 1947-49	Average 1956-57
	pounds	pounds	pounds	pounds
Beef and veal	61.9	63.7	75.3	94.1
Lamb and mutton	5.4	6.8	4.8	4.3
Pork	67.8	56.5	68.4	64.4
Chicken and turkey	15.9	15.6	22.0	30.6
Fish	11.8	11.0	10.5	10.2
Eggs	40.5	37.5	48.8	47.4
Cheese	4.6	5.6	7.0	7.9
Fluid milk and cream	337.6	330.0	359.0	351.5
Butter	18.0	17.0	10.6	8.6
Potatoes, dry beans and peas and peanuts	180.0	165.3	138.3	124.8
Wheat, rye and rice	266.9	236.8	200.7	175.9
Corn and other grains	81.9	60.6	61.7	52.1
Fresh fruits	144.6	139.0	132.2	99.2
Canned fruits, juices and dried fruit	18.6	25.5	41.9	47.0
Melons	32.9	27.0	27.4	26.8
Sugar	102.4	97.4	95.1	97.8

* Source: G. T. Barton and R. F. Daly, "Prospects for Agriculture in a Growing Economy", Conference on Problems and Policies of Agriculture, Iowa State College, Ames, October, 1958.

TABLE IV. DIRECT SHIPMENTS OF STOCKER AND FEEDER CATTLE INTO SELECTED NORTH CENTRAL STATES BY STATE OF ORIGIN 1956-60.*^{a/}

State of Origin	1956	1957	1958	1959	1960
	No.	No.	No.	No.	No.
Region 1					
Mont.	423,495	409,604	502,298	458,903	543,217
S. Dak.	444,958	508,754	405,335	577,317	497,140
Total	868,453	918,358	907,633	1,036,220	1,040,357
Region 2					
Ill.	10,606	13,394	14,681	15,874	16,064
Iowa	7,935	16,642	26,450	44,356	44,857
Mo.	96,852	160,063	175,059	218,715	190,560
Total	115,393	190,099	216,190	278,945	251,481
Region 5					
Neb.	492,050	417,144	255,641	360,401	372,861
Kans.	246,138	150,145	229,364	448,984	351,528
Okla.	68,958	78,116	84,931	148,139	113,112
Texas	216,415	217,544	279,200	354,022	391,302
Total	1,023,561	862,949	849,136	1,311,546	1,228,803
Region 6					
N. Mex.	61,743	44,418	47,172	58,276	71,296
Ariz.	470	2,233	5,026	2,784	661
Colo.	109,341	123,651	98,173	132,819	154,712
Idaho	12,246	11,475	19,865	30,241	20,784
Nev.		390	2,198	7,006	3,048
Utah	2,714	5,173	3,304	6,589	4,417
Wyo.	151,732	188,587	160,379	183,986	195,340
Total	338,246	375,927	336,117	421,701	450,258
Region 7					
Cal.	191	101	53	4,971	1,902
Ore.	2,924	3,383	14,467	18,520	11,630
Wash.	726	720	5,325	4,593	1,443
Total	3,841	4,204	19,845	28,084	14,975
Other States	267,270	563,470	838,750	752,712	761,406
Total	2,616,764	2,915,007	3,167,671	3,829,208	3,747,280

* Sources: United States Department of Agriculture, Livestock and Meat Statistics, Statistical Bulletin No. 230, Agricultural Marketing Service, Washington, D. C., 1960.

^{a/} Selected north central states include Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, South Dakota, and Nebraska.

TABLE V. SHIPMENTS OF STOCKER AND FEEDER CATTLE INTO CALIFORNIA, BY STATE OF ORIGIN, 1956-60.*

State of Origin	1956	1957	1958	1959	1960
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1					
Mont.	107	56	38	28	33
Region 5					
Kans.	15	4	20	12	13
Neb.	8	12	7	4	5
Okla.	44	26	27	29	41
Texas	294	199	308	324	496
Total	361	241	362	369	555
Region 6					
Ariz.	180	123	176	187	259
Colo.	21	16	15	16	17
Idaho	53	52	48	51	58
Nev.	100	128	111	120	151
N. Mex.	118	46	49	47	64
Utah	50	47	38	41	61
Wyo.	12	13	11	5	5
Total	534	425	448	467	615
Region 7					
Ore.	130	110	123	148	152
Wash.	8	3	5	5	5
Total	138	113	128	153	157
Misc.	36	43	67	78	72
Total	1,176	878	1,043	1,095	1,432

* Source: California Crop and Livestock Reporting Service, California Annual Livestock Report, Agricultural Marketing Service, United States Department of Agriculture, Sacramento, California.

TABLE VI. SUPPLY AND DISTRIBUTION OF FEED GRAINS, UNITED STATES, 1956-60.*

Year Beginning		SUPPLY ^{a/}				UTILIZATION			
		Carryover	Production	Imports	Total Supply	Livestock Feeds ^{b/}	Food and Industrial Use	Seed	Exports
		mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.	mil.bu.
Corn									
October	1956	1165	3075	1	4241	2377	268	11	165
	1957	1420	3045	2	4467	2534	269	11	183
	1958	1470	3356	1	4827	2781	289	13	214
	1959	1530	3825	1	5356	3056	289	12	210
	1960 ^{c/}	1789	3891	1	5681	3096	290	10	260
Oats									
July	1956	347	1163	17	1527	1116	39	107	25
	1957	240	1301	25	1566	1079	40	96	26
	1958	325	1416	3	1744	1214	41	91	30
	1959	368	1066	3	1436	1001	43	81	43
	1960 ^{c/}	268	1162	2	1432	959	81	81	25
Barley									
July	1956	117	377	27	521	216	89	27	62
	1957	127	437	24	588	215	87	26	92
	1958	168	475	14	657	228	90	27	117
	1959	195	422	18	635	232	92	25	118
	1960 ^{c/}	168	423	15	606	242	90	24	85
Sorghum Grain									
October	1956	81	206	d/	287	174	9	3	22
	1957	79	564	d/	643	265	9	3	57
	1958	309	610	d/	919	297	9	3	100
	1959	510	585	d/	1095	399	12	3	99
	1960 ^{c/}	582	638	d/	1220	406	12	2	75

* Source: United States Department of Agriculture, The Feed Situation, FDS-188, Agricultural Marketing Service, Washington, D. C., July 1961.

- ^{a/} Production figures revised as a result of 1959 census.
- ^{b/} Residual; includes small quantities for other uses and waste.
- ^{c/} Preliminary.
- ^{d/} Not reported separately.

TABLE VII. STOCK OF FEED GRAINS, ALL POSITIONS, 7 REGIONS, UNITED STATES, 1956-60.*

		CORN		OATS		BARLEY		SORGHUM GRAIN	
		October 1		July 1		July 1		October 1	
		Total	On Farms	Total	On Farms	Total	On Farms	Total	On Farms
		1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.
Region 1									
	1956	63,957	14,819	71,216	55,536	37,065	22,219	53	49
	1957	76,339	21,525	42,517	35,372	45,497	23,487	99	63
	1958	92,241	26,897	75,084	61,998	62,708	35,056	1,207	513
	1959	87,194	22,582	90,398	72,405	80,429	38,508	1,294	618
	1960	79,230	17,016	45,224	36,468	72,476	32,013	895	307
Region 2									
	1956	906,163	223,012	214,373	178,290	40,052	6,600	392	87
	1957	1,037,259	332,346	149,620	129,458	28,296	6,974	418	123
	1958	1,117,417	243,970	180,012	161,134	26,645	6,064	17,330	969
	1959	1,155,085	205,211	209,843	179,990	40,352	10,002	16,938	1,442
	1960	1,382,455	333,958	178,368	157,090	46,964	10,317	25,367	1,140
Region 3									
	1956	20,388	6,837	17,365	11,015	5,564	1,181	14	-----
	1957	37,886	11,756	11,430	8,025	5,506	1,174	27	-----
	1958	40,216	7,087	13,372	10,573	2,659	1,082	516	-----
	1959	40,270	11,746	13,928	11,147	2,522	1,288	16	-----
	1960	35,469	9,883	14,148	12,282	1,438	481	20	-----
Region 4									
	1956	38,399	32,912	14,564	5,255	1,522	901	306	158
	1957	36,063	28,573	10,053	4,612	2,702	1,295	153	80
	1958	25,904	19,056	8,368	3,920	1,397	689	7,008	243
	1959	36,112	28,330	4,559	2,879	1,008	757	4,391	319
	1960	27,111	18,412	5,349	3,992	1,902	964	5,237	126
Region 5									
	1956	124,260	21,881	21,941	17,504	3,706	2,262	73,549	4,733
	1957	164,705	20,537	13,520	8,411	11,273	1,223	70,801	2,779
	1958	183,558	42,157	35,484	30,872	13,903	5,581	249,631	11,068
	1959	204,047	59,836	36,812	28,951	13,542	5,814	413,079	16,472
	1960	263,530	78,135	17,789	15,290	9,821	5,258	483,524	20,208

* See asterick on next page.

TABLE VII. STOCK OF FEED GRAINS, ALL POSITIONS, 7 REGIONS, UNITED STATES, 1956-60.* (Continued)

		CORN October 1		OATS July 1		BARLEY July 1		SORGHUM GRAIN October 1	
		Total 1000 bu.	On Farms 1000 bu.	Total 1000 bu.	On Farms 1000 bu.	Total 1000 bu.	On Farms 1000 bu.	Total 1000 bu.	On Farms 1000 bu.
Region 6									
	1956	1,019	470	3,963	3,093	5,007	2,884	2,908	475
	1957	1,091	528	4,181	3,159	5,153	2,944	2,773	366
	1958	4,566	1,941	5,566	4,330	15,895	10,848	9,230	537
	1959	2,891	1,334	3,887	2,671	8,318	5,230	13,299	437
	1960	2,907	968	3,564	2,792	5,694	3,853	14,687	606
Region 7									
	1956	11,309	164	3,567	1,434	20,830	1,977	873	-----
	1957	2,307	76	5,810	2,138	26,309	3,297	932	-----
	1958	3,587	182	8,167	2,297	44,452	2,447	24,412	-----
	1959	1,909	153	9,638	1,691	45,913	2,383	44,200	-----
	1960	1,423	162	5,516	1,194	26,041	1,834	44,732	-----
Unallocated									
	1956	-----	-----	-----	-----	3,350	1,415	3,281	51
	1957	1,002	935	1,356	665	3,492	1,170	5,437	1
	1958	-----	-----	-----	-----	1,456	695	-----	-----
	1959	1,479	440	-----	-----	917	245	8,274	48
	1960	6,662	5,698	-----	-----	2,613	1,513	6,303	242
United States									
	1956	1,165,495	300,095	346,989	272,127	117,096	39,439	81,376	5,553
	1957	1,356,652	416,276	238,487	191,840	128,228	41,546	80,640	3,412
	1958	1,467,489	341,290	326,053	275,124	169,115	62,462	309,334	13,330
	1959	1,528,987	329,632	369,065	299,734	193,001	64,227	501,491	19,336
	1960	1,798,787	464,232	269,958	229,108	166,949	56,233	580,765	22,629

* Source: United States Department of Agriculture, Stocks of Grains in All Positions, GrLg 11-1, Crop Reporting Board, Agricultural Marketing Service, Washington, D. C.

TABLE VIII. INTERREGIONAL SHIPMENTS OF NONGOVERNMENT GRAIN FROM COUNTRY ELEVATORS IN NORTH CENTRAL AREA, 1958.*

Destination and Kind of Grain	Total Shipments ^{a/} 1000 bu.	Rail percent	Truck percent
West:			
Corn	15,666	30.6	69.4
Soybeans	1,939	55.8	44.2
Wheat	326	66.9	33.1
Oats	247	---	100.0
Barley	24	---	100.0
Grain Sorghums	5,236	80.9	19.1
Total	23,428		
Southwest:			
Corn	27,474	5.4	66.3
Soybeans	8,223	43.9	13.6
Wheat	6,166	13.3	19.9
Oats	2,977	---	95.4
Barley	1,144	49.3	50.7
Grain Sorghums	5,075	68.7	31.3
Total	51,029		
East:			
Corn	9,514	55.9	44.1
Soybeans	503	100.0	---
Wheat	5,771	99.8	0.2
Oats	881	61.2	38.8
Barley	---	---	---
Grain Sorghums	432	---	100.0
Total	17,101		
Southeast:			
Corn	60,548	3.8	95.4
Soybeans	8,562	75.1	20.9
Wheat	4,474	67.2	32.8
Oats	4,712	0.7	99.3
Barley	94	---	100.0
Grain Sorghums	585	31.8	68.2
Total	78,975		

* Source: United States Department of Agriculture, Grain Transportation in the North Central Region, Marketing Research Report No. 490, Agricultural Marketing Service, Washington, D. C.

^{a/} Shipments include movement by rail, truck and barge. Where rail and truck percentage do not total 100, the balance is barge traffic.

TABLE IX. REGION TO REGION MOVEMENT OF FEED GRAINS VIA RAIL TRANSPORTATION, 7 REGIONS, UNITED STATES, 1959.*

FROM \ TO	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
	tons	tons	tons	tons	tons	tons	tons
				<u>CORN</u>			
Region 1	-----	2,559	-----	-----	41	-----	162
Region 2	-----	110,856	14,903	26,891	5,882	20	1,670
Region 3	-----	-----	3,486	2,222	-----	-----	-----
Region 4	-----	271	225	7,735	-----	-----	-----
Region 5	-----	10,330	-----	3,417	16,965	1,255	1,221
Region 6	-----	155	-----	-----	53	108	56
Region 7	-----	-----	-----	-----	-----	-----	616
				<u>SORGHUM GRAIN</u>			
Region 1	-----	104	-----	58	-----	-----	-----
Region 2	-----	1,855	78	1,826	3,878	-----	40
Region 3	-----	-----	-----	320	-----	-----	-----
Region 4	-----	-----	-----	-----	-----	-----	-----
Region 5	-----	4,606	-----	1,143	51,156	1,625	7,047
Region 6	-----	-----	-----	-----	265	499	721
Region 7	-----	-----	-----	-----	-----	-----	889
				<u>OATS</u>			
Region 1	-----	3,549	-----	-----	237	-----	-----
Region 2	-----	19,194	4,370	2,993	403	40	81
Region 3	-----	-----	1,271	261	-----	-----	-----
Region 4	-----	-----	80	613	120	-----	-----
Region 5	-----	371	-----	162	1,129	-----	-----
Region 6	-----	-----	-----	-----	-----	-----	414
Region 7	-----	-----	-----	-----	-----	55	1,154
				<u>BARLEY AND RYE</u>			
Region 1	899	18,685	-----	-----	-----	-----	4,685
Region 2	-----	15,490	1,136	1,525	1,417	-----	105
Region 3	-----	-----	338	104	-----	-----	-----
Region 4	-----	-----	-----	50	-----	-----	-----
Region 5	-----	1,375	-----	117	5,934	-----	-----
Region 6	-----	394	-----	-----	23	149	593
Region 7	-----	771	-----	-----	-----	-----	9,398

* Source: Interstate Commerce Commission, State to State Distribution Products of Agriculture, Carload Waybill Statistics, Bureau of Transportation Economics and Statistics, Washington, D. C., 1959.

TABLE X. SOUTHERN CALIFORNIA PACKERS: LIVESTOCK PURCHASES AND PERCENTAGES BOUGHT FROM SPECIFIED SOURCES, BY SPECIES, 1956.*^{a/}

Species	Quantity Purchased ^{b/} 1000 lbs.	Supply Sources			Total
		California	Other Western States ^{c/}	Other States	
		percent	percent	percent	percent
Beef	918,498	74.5	22.4	3.1	100.0
Veal	42,860	76.3	6.1	17.6	100.0
Lamb	52,965	67.8	32.2	^{d/}	100.0
Hogs	267,805	9.3	.5	90.2	100.0
Total	1,282,128	60.7	17.7	21.6	100.0

* Source: United States Department of Agriculture, Meat Distribution in the Los Angeles Area, Marketing Research Report No. 347, Agricultural Marketing Service, Washington, D. C., 1959.

^{a/} Southern California was defined to include all California territory south of the northern boundaries of Kern and San Luis Obispo Counties.

^{b/} Equivalent carcass weight of livestock purchased and weight of small quantities of dressed carcasses purchased as estimated from data collected in the study and data supplied by the Crop and Livestock Reporting Service of the California Department of Agriculture.

^{c/} Includes Ariz., Colo., Mont., Nev., N. Mex., Ore., Utah, Wash., Idaho, and Wyo.

^{d/} Less than 0.05 percent.

TABLE XI. ESTIMATED DISTRIBUTION OF SALES BY MEATPACKERS TO DIFFERENT CLASSES OF CUSTOMERS, 1929, 1935, 1939, 1948 and 1954.*

Year	Packer- owned Branch Houses	Independent Wholesalers and Jobbers	Retail Stores	Institutions and Other Large Users	Export	Total
	percent	percent	percent	percent	percent	percent
1929	47	14	32	4	3	100
1935	34	11	46	8	1	100
1939	30	11	49	8	2	100
1948	20	11	59	9	1	100
1954	19	16	55	9	1	100

* Source: United States Department of Agriculture, Marketing Costs and Margins for Livestock and Meat, Marketing Research Report No. 418, Agricultural Marketing Service, Washington, D. C.

TABLE XII. BEEF CONSUMPTION IN MAJOR METROPOLITAN AREAS, U. S., 1960.*

City	Population	Per Capita Beef Consumption ^{a/}	Estimated Beef Consumption
	thou.	lbs.	mil. lbs.
Region 2			
Chicago, Ill.	6,221	104.2	648.2
Detroit, Mich.	3,762	104.2	392.0
Cleveland, Ohio	1,797	104.2	187.2
Milwaukee, Wis.	1,194	104.2	124.4
Cincinnati, Ohio - Ky.	1,072	104.2	111.7
Indianapolis, Ind.	698	104.2	72.7
Dayton, Ohio	695	104.2	72.4
Columbus, Ohio	683	104.2	71.2
Gary - Hammond - East Chicago, Ind.	573	104.2	59.7
Akron, Ohio	513	104.2	53.5
St. Louis, Mo. - Ill.	2,060	104.2	214.7
Minneapolis - St. Paul, Minn.	1,482	104.2	154.4
Kansas City, Mo. - Kan.	1,039	104.2	108.3
TOTAL	21,789		2,270.4
Region 3			
New York, N. Y.	10,695	87.8	939.0
Philadelphia, Pa. - N. J.	4,343	87.8	381.3
Boston, Mass.	2,589	87.8	227.3
Pittsburg, Pa.	2,405	87.8	211.2
Newark, N. J.	1,689	87.8	148.3
Buffalo, N. Y.	1,307	87.8	114.8
Patterson - Clifton - Passaic N. J.	1,187	87.8	104.2
Providence - Pawtucket, R. I. Mass.	816	87.8	71.6
Albany - Schenectady - Troy, N. Y.	658	87.8	57.8
Jersey City, N. J.	611	87.8	53.6
Rochester, N. Y.	586	87.8	51.5
Syracuse, N. Y.	564	87.8	49.5
Hartford, Conn.	525	87.8	46.1
TOTAL	27,975		2,456.2

* See asterick on next page.

^{a/} See footnote on next page.

TABLE XII. BEEF CONSUMPTION IN MAJOR METROPOLITAN AREAS, U. S., 1960.*
(Continued)

City	Population	Per Capita Beef Consumption ^{a/}	Estimated Beef Consumption
	thou.	lbs.	mil. lbs.
Region 4			
Washington, D. C. - Md. - Va.	2,002	74.2	148.5
Baltimore, Md.	1,727	74.2	128.1
Atlanta, Ga.	1,017	74.2	75.5
Miami, Fla.	935	74.2	69.4
New Orleans, La.	868	74.2	64.4
Tampa - St. Petersburg, Fla.	772	74.2	57.3
Birmingham, Ala.	635	74.2	47.1
Louisville, Ky. - Ind.	725	74.2	53.8
Memphis, Tenn.	627	74.2	46.5
Norfolk - Portsmouth, Va.	579	74.2	43.0
TOTAL	9,887		733.6
Region 5			
Houston, Tex.	1,243	74.2	92.2
Dallas, Tex.	1,084	74.2	80.4
San Antonio, Tex.	687	74.2	51.0
Fort Worth, Tex.	573	74.2	42.5
Oklahoma City, Okla.	512	74.2	38.0
TOTAL	4,099		304.1
Region 6			
Phoenix, Ariz.	664	104.2	69.2
Denver, Colo.	929	104.2	96.8
TOTAL	1,593		166.0
Region 7			
Los Angeles - Long Beach, Calif.	6,743	104.2	702.6
San Francisco - Oakland, Calif.	2,783	104.2	290.0
Seattle, Wash.	1,107	104.2	115.3
San Diego, Calif.	1,033	104.2	107.6
Portland, Ore. - Wash.	821	104.2	85.5
San Bernardino - Riverside, Calif.	809	104.2	84.3
San Jose, Calif.	642	104.2	66.9
TOTAL	13,938		1,452.2

* See asterick on next page.

^{a/} See footnote on next page.

TABLE XII. BEEF CONSUMPTION IN MAJOR METROPOLITAN AREAS, U. S., 1960.*
(Continued)

City	Population	Per Capita Beef Consumption ^{a/}	Estimated Beef Consumption
	thou.	lbs.	mil. lbs.
Total 50 Metropolitan Areas	79,281		7,382½

* Source: Department of Commerce, U. S. Census of Population, 1960,
Bureau of the Census, Washington, D. C., 1960.

United States Department of Agriculture, Food Consumption of
Households in the United States, HFC 1, Washington, D. C.,
United States Government Printing Office, 1956.

^{a/} Primary distribution (carcass) weight.

TABLE XIII. PRODUCTION, ACREAGE AND YIELD OF FEED GRAINS, AVERAGE FOR 1956-60, REGION 1.*

Feed Grains	Production	Harvest Acreage	Yield
	1000 bu.	1000 ac.	bu.
Corn			
Montana	187	8	23.7
N. Dakota	10,594	401	26.4
S. Dakota	96,780	3,160	30.2
Region 1	107,561	3,569	29.7
Oats			
Montana	8,040	239	33.6
N. Dakota	57,398	1,792	31.7
S. Dakota	86,224	2,675	31.0
Region 1	151,662	4,706	31.5
Barley			
Montana	43,388	1,593	27.4
N. Dakota	82,990	3,514	23.6
S. Dakota	11,087	483	22.5
Region 1	137,465	5,590	24.5
Grain Sorghums			
Montana			
N. Dakota			
S. Dakota	4,767	171	26.7
Region 1	4,767	171	26.7

* Source: United States Department of Agriculture, Grain and Feed Statistics, Statistical Bulletin No. 159, Agricultural Marketing Service, Washington, D. C., 1960.

TABLE XIV. PRODUCTION, ACREAGE AND YIELD OF FEED GRAINS, REGION 1 AND UNITED STATES, AND PERCENT REGION 1 OF UNITED STATES, AVERAGE FOR 1956-60.*

Feed Grains	Production	Harvested Acreage	Yield
	1000 bu.	1000 ac.	bu.
Corn			
Region 1	107,471	3,569	29.7
United States	3,492,496	68,167	51.1
Percent	3.0	5.2	58.1
Oats			
Region 1	151,662	4,706	31.5
United States	1,221,513	31,129	39.4
Percent	12.4	15.1	79.9
Barley			
Region 1	137,465	5,590	24.5
United States	426,890	14,378	29.7
Percent	32.2	38.9	82.5
Grain Sorghum			
Region 1	4,767	171	26.7
United States	520,766	15,303	33.3
Percent	1.0	1.1	80.2

* Source: United States Department of Agriculture, Grain and Feed Statistics, Statistical Bulletin No. 159, Agricultural Marketing Service, Washington, D. C., 1960.

TABLE XV. FEED GRAIN REQUIREMENTS, 1975 PROJECTED, UNITED STATES.*

Requirements ^{a/}	Corn ^{b/}	Feed Grains		Grain Sorghums
		Oats	Barley	
	1000 bu.	1000 bu.	1000 bu.	1000 bu.
All uses, 1975	3,992,000	1,600,200	707,000	381,500

* Source: Robert O. Rogers and Glen T. Barton, Our Farm Production Potential 1975, Bulletin No. 233, Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C., 1960.

^{a/} Based on United States population of 230 million, exports of agricultural commodities somewhat below 1956 level, and a 10 percent increase in livestock feeding efficiency over the 1956 level. Calculated by multiplying required crop acreage by economic attainable yields for 1975.

^{b/} Adjusted to include only corn for grain.

TABLE XVI. PRODUCTION, ACREAGE AND YIELDS OF FEED GRAINS, 1975
PROJECTED, UNITED STATES AND REGION 1.*

Feed Grains	Production ^{a/} 1000 bu.	Harvested Acreage ^{b/} 1000 ac.	Yield ^{c/} bu.
Corn			
United States	3,992,000	73,925	54.0
Region 1	122,835	3,870	31.4
Oats			
United States	1,600,200	38,100	42.0
Region 1	198,665	5,760	33.6
Barley			
United States	707,000	20,200	35.0
Region 1	227,660	7,850	28.9
Grain Sorghums			
United States	381,500	10,900	35.0
Region 1	3,490	122	28.1

* Source: Tables XIV and XV.

^{a/} Production in United States is assumed to be 1975 requirements for feed grains. Production in Region 1 is assumed to be the same percent of U. S. production as in 1956-60.

^{b/} Harvested acreages are those necessary to meet production requirements assuming economically attainable yields.

^{c/} Economically attainable yields.

TABLE XVII. PRODUCTION, ACREAGE AND YIELD OF FEED GRAINS, 1975
PROJECTED, REGION 1.*

Feed Grains	Production ^{a/} 1000 bu.	Harvested Acreage ^{b/} 1000 ac.	Yield ^{c/} bu.
Corn			
Montana	213	8	25.3
N. Dakota	12,099	435	28.2
S. Dakota	110,523	3,427	32.2
Region 1	122,835	3,870	31.7
Oats			
Montana	10,533	293	35.8
N. Dakota	75,186	2,193	33.8
S. Dakota	112,946	3,274	33.1
Region 1	198,665	5,760	33.6
Barley			
Montana	71,856	2,237	32.3
N. Dakota	137,442	4,935	27.8
S. Dakota	18,362	678	26.5
Region 1	227,660	7,850	28.9
Grain Sorghums			
Montana			
N. Dakota			
S. Dakota	3,490	122	28.1
Region 1	3,490	122	28.1

* Source: Tables XIV and XVI.

^{a/} Production in Montana, North Dakota, and South Dakota is assumed to be the same percent of production in Region 1 as in 1956-60.

^{b/} Harvested acreages are those necessary to meet production requirements assuming economically attainable yields.

^{c/} Economically attainable yields.

TABLE XVIII. PRODUCTION, ACREAGE AND YIELD OF FEED GRAINS, 1965
PROJECTED, REGION 1.*

Feed Grains	Production	Harvested Acreage ^{a/}	Yield
	1000 bu.	1000 ac.	bu.
Corn ^{b/}			
Montana	98	4	24.5
N. Dakota	9,309	341	27.3
S. Dakota	75,223	2,411	31.2
Region 1	84,630	2,756	30.7
Oats			
Montana	7,322	211	34.7
N. Dakota	62,326	1,906	32.7
S. Dakota	79,936	2,373	32.0
Region 1	149,584	4,490	32.5
Barley			
Montana	53,908	1,809	29.8
N. Dakota	84,245	3,278	25.7
S. Dakota	10,462	427	24.5
Region 1	148,615	5,514	26.7
Grain Sorghums			
Montana			
N. Dakota			
S. Dakota	3,520	128	27.5
Region 1	3,520	128	27.5

* Source: Estimates of production in 1965 were based on (1) an assumption of a national feed grain program which would control acreages of corn, oats, barley and grain sorghums at 1962 levels, and (2) yields of corn, oats, barley and grain sorghums which will exceed 1956-60 averages by 50 percent of the projected increase for 1975.

^{a/} Based on March 1, 1962 intentions to plant.

^{b/} Adjusted to include only corn for grain.

TABLE XIX. FEEDER CATTLE PRODUCTION, AVERAGE FOR 1956-60, UNITED STATES AND REGION 1.*

Location	Calf Production						Disposition of Calf Crop							Total Cattle Avail. For Feeding
	All	Dairy	Beef	Calves	Calf	Net	Heifers For Dairy Repl.	Heifers For Beef Repl.	Calves Kept For Bulls	Farm Calf Slaughter	Comm. Calf Slaughter	Deaths During Year	Total Other Uses	
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
United States	46,987	22,019	24,968	40,238	2,383	37,855	5,111	6,488	415	427	9,926	756	23,123	14,732
Region 1	3,732	793	2,939	3,351	167	3,184	157	562	40	22	25	63	869	2,315
Montana	1,196	100	1,096	1,084	59	1,025	20	195	12	7	5	20	259	766
N. Dakota	980	373	607	870	46	824	74	120	10	8	18	16	246	578
S. Dakota	1,556	320	1,236	1,397	62	1,335	63	247	18	7	2	27	364	971

* Source: United States Department of Agriculture, Meat Animals, Statistical Bulletin No. 284, and Livestock and Poultry Inventory, Statistical Bulletin No. 278, Agricultural Marketing Service, Washington, D. C., 1960.

TABLE XX. FEEDER CATTLE PRODUCTION, 1975 PROJECTED, UNITED STATES.*

Location	Calf Production						Disposition of Calf Crop							Total Cattle Avail. For Feeding
	All Cows ^{a/}	Dairy Cows ^{b/}	Beef Cows ^{c/}	Calves Born ^{d/}	Calf Deaths ^{e/}	Net Calves	Heifers For Dairy Repl. ^{f/}	Heifers For Beef Repl. ^{f/}	Calves Kept For Bulls ^{f/}	Farm Calf Slaughter ^{g/}	Comm. Calf Slaughter ^{h/}	Deaths During Year ^{f/}	Total Other Uses	
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
United States	56,250	22,500	33,750	50,625	2,530	48,095	5,222	8,770	522	427	9,619	962	25,522	22,573

* Source: Rex F. Daly, "The Long Run Demand for Farm Products", Agricultural Economics Research, Vol. VIII, No. 3, United States Department of Agriculture, Washington, D. C., July, 1956.

The 1975 requirements for cattle and calves are based on (1) a population of 210 million people, (2) an increase in per capita disposable income of 60 percent, and (3) trends in popular consumption habits. They have been estimated to be about 138 percent of 1953 requirements.

Projected requirements point to around 125 million head of cattle on farms by 1975.

- ^{a/} Since 1955, all cows two years and older have been a decreasing proportion of cattle on farms. In 1956-60 they were 50 percent of cattle on farms. For 1975, it is estimated that all cows will be 45 percent of cattle on farms, or 45 percent of 125 million head.
- ^{b/} In the reference quoted above, Daly predicted a small increase in the number of cows milked. In 1956-60 dairy cows were 47 percent of all cows. For 1975 it is estimated that dairy cows will be 40 percent of all cows. Their number in 1975 will be 102 percent of the 1956-60 average.
- ^{c/} In 1956-60 beef cows were 53 percent of all cows. For 1975 it is estimated that beef cows will be 60 percent of all cows. Their number in 1975 will be 135 percent of the 1956-60 average.
- ^{d/} A 90 percent calf crop is estimated for 1975.
- ^{e/} A 5 percent rate of death for calves is estimated for 1975.
- ^{f/} Proportions for 1975 are estimated to be equal to those for 1960.
- ^{g/} No change is expected in farm calf slaughter from the 1956-60 average.
- ^{h/} It is estimated that commercial calf slaughter will decline from 26 percent of net calves in 1956-60 to 20 percent of net calves in 1975.

TABLE XXI. FEEDER CATTLE PRODUCTION, 1975 PROJECTED, REGION 1.*

Location	Calf Production						Disposition of Calf Crop							Total Cattle Avail. For Feeding
	All Cows ^{a/}	Dairy Cows ^{b/}	Beef Cows ^{c/}	Calves Born ^{d/}	Calf Deaths ^{e/}	Net Calves	Heifers For Dairy ^{f/}	Heifers For Beef ^{f/}	Calves Kept For Bulls ^{f/}	Farm Calf Slaughter ^{g/}	Comm. Calf Slaughter ^{h/}	Deaths During Year ^{f/}	Total Other Uses	
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1	4,467	600	3,867	4,244	170	4,074	119	739	51	22	2	81	1,014	3,060
Montana	1,518	76	1,442	1,422	58	1,384	15	257	15	7	1	27	322	1,062
N. Dakota	1,081	282	799	1,027	41	986	56	158	13	8	1	20	256	730
S. Dakota	1,868	242	1,626	1,775	71	1,704	48	324	23	7	0	34	436	1,268

* Source: Projections for Region 1 are based on projections for the United States in Table XX. Some adjustments are made, however, for circumstances peculiar to Region 1.

- ^{a/} The proportion of all cows in Region 1 to all cows in the United States in 1975 is estimated to be the same as the average for 1956-60.
- ^{b/} Numbers of dairy cows in Region 1 are expected to follow the downward trend of the last ten years. It is estimated that dairy cow numbers in 1975 will be only 75 percent of the 1956-60 average.
- ^{c/} An increase in beef cow numbers in Region 1 similar in proportion to that for the United States is predicted. The projection of beef cow numbers for 1975 is 132 percent of the 1956-60 average.
- ^{d/} Calf crops in Region 1 have averaged 90 percent in recent years. A 95 percent calf crop is predicted for 1975.
- ^{e/} Calf deaths are predicted to be 4 percent in 1975.
- ^{f/} Proportions for 1975 are estimated to be equal to those for 1956-60.
- ^{g/} Farm calf slaughter in 1975 is predicted to be unchanged from 1956-60.
- ^{h/} In 1960 commercial calf slaughter was down to 4 thousand head. It is predicted that commercial calf slaughter will decline further in Region 1 so that by 1975 it will be no more than 2 thousand head.

TABLE XXII. FEEDER CATTLE PRODUCTION, 1965 PROJECTED, REGION 1.*

Location	Calf Production						Disposition of Calf Crop							Total Cattle Avail. For Feeding
	All Cows ^{a/}	Dairy Cows ^{b/}	Beef Cows ^{c/}	Calves Born ^{d/}	Calf Deaths ^{e/}	Net Calves	Heifers For Dairy Repl. ^{f/}	Heifers For Beef Repl. ^{f/}	Calves Kept For Bulls ^{f/}	Farm Calf Slaughter ^{g/}	Comm. Calf Slaughter ^{h/}	Total During Year ^{f/}	Total Other Uses	
	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.	1000 hd.
Region 1	3,916	665	3,251	3,602	162	3,440	132	622	43	22	3	69	891	2,549
Montana	1,296	84	1,212	1,192	54	1,138	17	215	13	7	1	23	276	862
N. Dakota	985	313	672	906	40	866	62	133	11	8	2	17	233	633
S. Dakota	1,635	268	1,367	1,504	68	1,436	53	274	19	7	0	29	382	1,054

* Source: Based on 1956-60 production and projection for 1975, Tables XIX and XXI.

- ^{a/} It is predicted that numbers of all cows will increase by about 107 percent of the 1956-60 average, or one-fourth of the increase projected for 1975.
- ^{b/} In 1960 dairy cow numbers were 709 thousand, down 84 thousand from the 1956-60 average. A further decline to 665 thousand is predicted for 1965.
- ^{c/} It is predicted that beef cow numbers will increase by about 110 percent of the 1956-60 average, or one-third of the increase projected for 1975.
- ^{d/} A 92 percent calf crop is predicted for 1965.
- ^{e/} Calf deaths are predicted to be 4.5 percent in 1965.
- ^{f/} Proportions for 1975 are estimated to be equal to those for 1956-60.
- ^{g/} Farm calf slaughter is predicted to be unchanged from 1956-60.
- ^{h/} Commercial calf slaughter is predicted to be 3 thousand head.

TABLE XXIII. INVESTMENT REQUIREMENTS AND NON-FEED COSTS, BUDGETED FOR COOPERATIVE FEEDLOT, SOUTH DAKOTA, 1960.*

CHARACTERISTICS:

Number of cattle fed annually	7,500
Capacity of feedlot	5,000
Ratio of number fed to capacity	1.5
Number of days feedlot operated	365

INVESTMENT PER HEAD IN FEEDLOT FACILITIES:

Land	\$.54
Feedlot	5.78
Feed mill and storage	16.66
Feeding equipment	1.26
Machinery	1.13
Water system	1.34
Miscellaneous	1.08
Working Capital	<u>2.66</u>
Total	\$30.45

NON-FEED COSTS PER HEAD

Salaries	\$ 5.16
Utilities	.64
Equipment expense	1.06
Death loss	1.22
Transportation	1.50
Interest on investment	2.97
Miscellaneous	<u>.58</u>
Total	\$13.13

* Source: Rex Helfinstine, Economic and Organizational Aspects of Cooperative Feedlots, Bulletin 494, Agricultural Experiment Station, South Dakota State College, Brookings, 1960.

TABLE XXIV. INVESTMENT REQUIREMENTS AND NON-FEED COSTS, 34 MONTANA FEEDLOTS, GROUPED BY NUMBER OF HEAD FED, 1959.*

CHARACTERISTICS:	I	II	III	IV	V
Average number of cattle fed annually	36	70	165	254	466
Average number of days feedlots operated	119	132	152	179	178
Number feedlots in each group	7	9	5	8	5
AVERAGE INVESTMENT PER HEAD IN FEEDLOT FACILITIES:					
Buildings, storage, sheds	\$ 9.75	\$13.26	\$ 8.84	\$ 9.55	\$ 9.25
Pens, yards, fences, corrals, chutes, traughs	31.36	20.74	11.29	11.21	9.94
Wells, pumps, pipe, tanks	3.17	3.00	1.86	1.98	1.40
Machinery and equipment	<u>21.53</u>	<u>14.68</u>	<u>11.58</u>	<u>12.60</u>	<u>8.52</u>
Total	\$65.81	\$51.68	\$33.57	\$35.34	\$29.11
AVERAGE NON-FEED COSTS PER HEAD:					
Taxes	\$.95	\$.92	\$.76	\$.72	\$.71
Repairs and depreciation	10.12	6.07	4.71	4.12	3.38
Interest on investment in feedlot	3.95	3.10	2.01	2.12	1.75
Veterinary and medicine	.71	.66	.30	.54	.53
Death loss	<u>2.74</u>	<u>2.24</u>	<u>1.82</u>	<u>1.43</u>	<u>1.42</u>
Total	\$18.47	\$12.99	\$ 9.60	\$ 8.93	\$ 7.79

* Source: Pius Weisgerber, Organization and Costs of Cattle Feeding in the Yellowstone Valley, Research Report No. 11, Agricultural Experiment Station, Montana State College, Bozeman, 1960.

TABLE XXV. COSTS OF CATTLE AND FEED, 4 SYSTEMS OF CATTLE FEEDING, FARM FEEDLOTS, SOUTH DAKOTA, 1960*.

CHARACTERISTICS:	I	II	III	IV	V	VI	VII
Kind of feeding system	Long-fed	Long-fed	Long-fed	Long-fed	Long-fed	Short-fed	Short-fed
Kind of cattle	Steer calves	Heifer calves	Yrl. steers	Yrl. steers	Heifer calves	2 yr. steers	2 yr. steers
Kind of ration	Lib. grain	Lib. grain	Lib. grain	Lib. Roughage	Lib. Roughage	Lib. grain	Lib. Roughage
Days on pasture	30-40	30-40	----	----	30-40	----	----
Days in feedlot	270	210	240	280	270	150	150
Pounds of gain	565	420	450	450	450	275	250
COST OF CATTLE (Per 100#)	\$28.00	\$26.00	\$25.00	\$23.00	\$26.00	\$23.00	\$23.00
FEED COST PER HEAD:							
Corn	\$58.00	\$45.00	\$52.00	\$ ----	\$33.00	\$33.00	\$ 3.00
Hay	15.30	11.34	13.50	---	9.00	8.40	14.00
Protein supplement	8.00	4.40	6.40	18.00	10.50	6.00	---
Corn silage	---	---	---	40.60	10.00	---	22.40
Total	<u>\$81.30</u>	<u>\$60.74</u>	<u>\$71.90</u>	<u>\$58.60</u>	<u>\$62.50</u>	<u>\$47.40</u>	<u>\$39.40</u>
FEED COST PER 100# GAIN	\$14.38	\$14.46	\$15.97	\$13.02	\$13.89	\$17.24	\$15.76

* Source: Livestock Feeding Outlook, 1960-61, Extension Circular No. 521, Cooperative Extension Service, South Dakota State College, Brookings, 1960.

TABLE XXVI. COSTS OF CATTLE AND FEED, 9 SYSTEMS OF CATTLE FEEDING, FARM FEEDLOTS, MONTANA, 1959-60.*

CHARACTERISTICS:	I	II	III	IV	V	VI	VII	VIII	IX
Kind of feeding system	Long-fed	Short-fed	Short-fed	Long-fed	Short-fed	Short-fed	Long-fed	Short-fed	Short-fed
Kind of cattle	Steer calves	Yrl. steers	2 yr. steers	Steer calves	Yrl. steers	2 yr. steers	Steer calves	Yrl. steers	2 yr. Steers
Kind of ration	Lib. grain	Lib. grain	Lib. grain	Lib. grain	Lib. grain	Lib. grain	Lib. grain	Lib. grain	Lib. grain
Days on pasture	---	---	---	---	---	---	---	---	---
Days in feedlot	250	155	110	250	155	110	250	155	110
Pounds of gain	500	350	250	500	350	250	500	350	250
COST OF CATTLE (Per 100#)	\$26.00	\$22.00	\$20.00	\$26.00	\$22.00	\$20.00	\$26.00	\$22.00	\$20.00
FEED COSTS PER HEAD:									
Barley	\$46.69	\$38.57	\$30.80	\$31.08	\$25.76	\$20.51	\$38.92	\$33.81	\$27.37
Alfalfa	15.00	10.84	7.70	15.00	10.84	7.70	10.00	7.74	5.50
Dry beet pulp	---	---	---	19.00	15.66	12.54	---	---	---
Silage	---	---	---	---	---	---	5.25	6.51	5.39
Total	\$61.69	\$49.41	\$38.50	\$65.08	\$52.20	\$40.75	\$54.17	\$48.06	\$38.26
FEED COSTS PER 100# GAIN	\$12.33	\$14.12	\$15.40	\$13.02	\$14.91	\$16.30	\$10.83	\$13.73	\$15.30

* Sources: "Feed Requirements for Cattle and Sheep", Farm and Home Development Handbook, FHD 471, Cooperative Extension Service, Montana State College, Bozeman.

Morris Taylor, Prices Paid by Montana Farmers and Ranchers, 1958-60, Bulletin 563, Agricultural Experiment Station, Montana State College, Bozeman, 1959.

TABLE XXVII. PRICES OF FEED GRAINS, HAY, AND SUPPLEMENT, 10 SELECTED STATES, 1956-60.*

	N. Dak.	S. Dak.	Montana	Ill.	Iowa	Neb.	Texas	Colo.	Arizona	Cal.
	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt
CORN ^{a/}										
1956	2.04	2.11	2.48	2.34	2.34	2.43	2.57	2.55	3.14	2.93
1957	1.87	1.64	2.30	2.05	1.87	1.95	2.02	2.02	2.89	2.48
1958	1.77	1.73	2.07	2.02	1.93	2.00	1.87	1.93	2.61	2.54
1959	1.66	1.71	2.25	1.89	1.77	1.84	1.96	2.00	2.71	2.50
1960	1.57	1.54	2.11	1.79	1.71	1.71	2.07	1.89	2.66	2.45
OATS ^{a/}										
1956	1.68	1.97	1.78	2.09	2.25	2.37	2.37	2.50	2.94	2.62
1957	1.47	1.59	1.59	1.91	1.84	1.87	2.09	2.09	2.87	2.22
1958	1.47	1.56	1.69	1.81	1.75	1.75	1.94	2.03	2.94	2.28
1959	1.62	1.84	1.81	2.06	1.97	1.97	2.09	2.28	2.87	2.47
1960	1.37	1.56	1.75	1.91	1.87	1.81	2.25	2.22	2.94	2.50
BARLEY ^{a/}										
1956	1.94	1.92	1.73	2.19	2.06	2.12	2.04	2.23	2.27	2.31
1957	1.75	1.71	1.50	1.83	1.87	1.67	1.87	1.60	2.29	2.04
1958	1.77	1.79	1.56	1.73	1.90	1.83	1.73	1.60	2.25	2.23
1959	1.62	1.69	1.40	1.67	1.62	1.52	1.67	1.60	2.35	2.15
1960	1.50	1.54	1.37	1.48	1.58	1.48	1.65	1.56	2.29	2.10
GRAIN SORGHUMS ^{a/}										
1956	--	1.79	--	1.87	1.91	2.04	1.98	2.25	2.54	2.57
1957	--	1.50	--	1.61	1.70	1.71	1.73	1.55	2.23	2.18
1958	--	1.64	--	1.62	1.84	1.84	1.77	1.64	2.07	2.14
1959	--	1.43	--	1.57	1.45	1.39	1.57	1.54	2.05	2.04
1960	--	1.36	--	1.46	1.45	1.41	1.54	1.46	2.00	1.95

* See asterick on next page.

^{a/} See footnote on next page.

TABLE XXVII. PRICES OF FEED GRAINS, HAY, AND SUPPLEMENT, 10 SELECTED STATES, 1956-60.* (Continued)

	N. Dak.	S. Dak.	Montana	Ill.	Iowa	Neb.	Texas	Colo.	Arizona	Cal.
	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt	dol/cwt
COTTONSEED MEAL ^{b/}										
1956	--	4.55	5.00	4.10	4.05	4.10	3.55	3.90	3.70	4.05
1957	4.60	4.65	4.80	4.20	4.10	4.15	3.70	3.90	3.70	4.00
1958	4.20	4.45	4.60	4.05	4.00	3.85	3.40	3.55	3.55	3.70
1959	4.35	4.85	4.60	4.65	4.65	4.55	3.95	4.00	3.95	4.25
1960	--	4.40	4.70	4.60	4.45	4.25	3.90	4.05	4.00	4.30
SOYBEAN MEAL ^{b/}										
1956	4.50	4.15	4.90	3.85	3.70	4.05	4.10	4.20	5.50	4.85
1957	4.40	4.00	4.80	3.75	3.60	3.90	4.00	4.10	5.50	4.70
1958	4.00	3.85	4.30	3.60	3.40	3.65	3.80	3.80	5.20	4.55
1959	4.70	4.70	4.80	4.40	4.35	4.55	4.25	4.50	5.50	5.40
1960	4.35	4.15	4.70	4.25	4.00	4.10	4.00	4.35	5.70	4.85
HAY ^{a/}	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton	dol/ton
1956	13.60	16.60	22.70	18.70	19.30	21.40	25.40	25.20	25.90	22.90
1957	12.10	10.40	16.90	18.80	15.10	12.40	22.80	17.90	26.50	22.40
1958	12.90	11.90	16.90	18.30	12.90	9.70	20.50	15.60	24.60	22.60
1959	19.80	20.70	23.20	19.20	14.30	14.80	22.30	22.00	25.70	25.50
1960	14.50	16.50	24.50	19.50	14.50	15.00	23.50	24.00	25.00	24.00

* Source: United States Department of Agriculture, Field and Seed Crops, CrPr 1 and Agricultural Prices, Pr 1, Agricultural Marketing Service, Washington, D. C., 1956-60.

^{a/} Seasonal average price per bushel converted to dollars per hundred weight.

^{b/} Average price paid by farmers, January 1, 1956-60.

TABLE XXVIII. RAIL FREIGHT RATES FOR CORN AND GRAIN SORGHUMS, SELECTED POINTS ORIGIN AND DESTINATION, 1962.* a/

From \ To	Billings	Chicago	St. Paul	Sioux City	Omaha	Kansas City	Oklahoma City	Ft. Worth	Albuquerque	Denver
	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.
Billings	xxx									
Chicago	B 199	xxx								
St. Paul	D 80	45 $\frac{1}{2}$	xxx							
Sioux City	D 87 $\frac{1}{2}$	50 $\frac{1}{2}$	31	xxx						
Omaha	B 115 $\frac{1}{2}$	50 $\frac{1}{2}$	38 $\frac{1}{2}$	20	xxx					
Kansas City	B 115 $\frac{1}{2}$	50 $\frac{1}{2}$	52 $\frac{1}{2}$	34	26 $\frac{1}{2}$	xxx				
Oklahoma City	B 193	79 $\frac{1}{2}$	81 $\frac{1}{2}$	62 $\frac{1}{2}$	55 $\frac{1}{2}$	39 $\frac{1}{2}$	xxx			
Ft. Worth	B 214	81 $\frac{1}{2}$	83 $\frac{1}{2}$	64 $\frac{1}{2}$	57 $\frac{1}{2}$	64 $\frac{1}{2}$	46 $\frac{1}{2}$	xxx		
Albuquerque	B 145 $\frac{1}{2}$	123 $\frac{1}{2}$	125 $\frac{1}{2}$	107	100	79 $\frac{1}{2}$	69	69	xxx	
Denver	B 115 $\frac{1}{2}$	93	81	52 $\frac{1}{2}$	42 $\frac{1}{2}$	45 $\frac{1}{2}$	61	76	69	xxx
Ogden	B 148	123 $\frac{1}{2}$	111 $\frac{1}{2}$	76 $\frac{1}{2}$	73 $\frac{1}{2}$	81 $\frac{1}{2}$	108	123	72	47
Idaho Falls	B 119	130	118	81 $\frac{1}{2}$	80	86 $\frac{1}{2}$	113	128	107	52
Phoenix	B 265	B 167	B 145 $\frac{1}{2}$	B 134	B 134	B 134	B 134	B 134	B 134	B 134
Spokane	D 79	B 167	B 134	B 134	B 134	B 134	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 134
Seattle	D 79	B 167	B 134	B 134	B 134	B 134	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 134
Portland	D 79	B 167	B 134	B 134	B 134	B 134	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 158 $\frac{1}{2}$	B 134
San Francisco	B 133	B 167	B 145 $\frac{1}{2}$	B 134	B 134	B 134	B 134	B 134	B 102	B 134
Los Angeles	B 133	B 167	B 145 $\frac{1}{2}$	B 134	B 134	B 134	B 134	B 134	B 111	B 134

* Source: Data obtained from railroads serving the selected points.

a/ All rates apply to minimum weight of 40,000 pounds except as noted

A = 80,000# min.

B = 60,000# min.

C = 110,000# min.

D = Minimum weight 80 percent marked capacity of car, but not less than 40,000#.

TABLE XXIX. RAIL FREIGHT RATES FOR BARLEY, SELECTED POINTS OF ORIGIN AND DESTINATION, 1962.* ^{a/}

From \ To	Billings	Sioux Falls	Chicago	St. Paul	Sioux City	Omaha	Kansas City	Oklahoma City	Ft. Worth	Albuquerque	Denver
	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.	cents/cwt.
Billings	xxx										
Chicago	C 116	56½	xxx								
St. Paul	D 80	N.A.	49½	xxx							
Sioux City	D 87½	N.A.	53½	37½	xxx						
Omaha	B 115½	N.A.	53½	45	26½	xxx					
Kansas City	B 115½	45½	53½	59	40½	33	xxx				
Oklahoma City	B 193	74	74½	96	69	64½	B 33½	xxx			
Ft. Worth	B 214	76	74½	102	78	70	B 71½	B 57½	xxx		
Albuquerque	B 145½	137	126½	125½	113½	106	B 98½	B 86	B 86	xxx	
Denver	B 115½	53½	96	81	52½	54½	45½	61	76	B 86	xxx
Ogden	B 148	100	126½	111½	76½	72½	81½	108	123	72	47
Idaho Falls	B 119	105	133	118	81½	80	86½	113	128	107	52
Phoenix	B 265	B 145	B 167	B 145½	B 134	B 134	B 134	B 134	B 134	B 134	B 134
Spokane	D 79	B 134	B 167	B 134	B 134	B 134	B 134	B 158½	B 158½	B 158½	B 134
Seattle	D 79	B 134	B 167	B 134	B 134	B 134	B 134	B 158½	B 158½	B 158½	B 134
Portland	D 79	B 134	B 167	B 134	B 134	B 134	B 134	B 158½	B 158½	B 158½	B 134
San Francisco	B 133	B 145½	B 167	B 145½	B 134	B 134	B 134	B 134	B 134	B 134	B 134
Los Angeles	B 133	B 145½	B 167	B 145½	B 134	B 134	B 134	B 134	B 134	B 134	B 134

* Source: Data obtained from railroads serving the selected points.

^{a/} All rates apply to minimum weight of 40,000 pounds except as noted

A = 80,000# min.

B = 60,000# min.

C = 100,000# min.

D = Minimum weight 80 percent marked capacity of car, but not less than 40,000#.

TABLE XXX. PRICES OF FEEDER CATTLE AND CALVES, 12 MARKETS, 1956-60.*

Market	Feeder Cattle				Feeder Calves			
	Steers		Heifers		Steers		Heifers	
	500-800#		500-800#		300-500#		300-500#	
	Good	Choice	Medium-good	Choice	Medium	Good-choice	Medium	Good-choice
	dollars	dollars	dollars	dollars	dollars	dollars	dollars	dollars
SIoux FALLS ^{a/}								
1958	25.89	29.07	22.80	25.95	---	32.18	---	29.20
1959	27.06	29.80	22.73	26.57	---	32.93	---	30.11
1960	24.61	26.31	18.58	23.73	---	28.13	---	25.19
BILLINGS								
1956	16.60	18.06	12.81	15.76	15.67	18.90	13.23	15.85
1957	20.02	21.55	15.98	18.78	18.62	22.59	16.80	19.60
1958	26.38	27.88	22.64	25.70	26.36	31.22	24.56	28.63
1959	27.29	29.07	22.98	26.30	27.75	33.28	26.15	29.90
1960	23.79	25.53	19.61	23.29	22.51	27.92	20.79	25.06
CHICAGO								
1956	17.70	20.18	14.48	17.36	16.28	20.34	13.95	17.42
1957	20.63	22.83	17.07	20.06	18.79	23.03	16.49	20.00
1958	26.73	29.41	23.34	26.29	25.79	31.56	23.60	28.34
1959	28.00	31.06	---	---	---	---	---	---
1960	24.47	27.09	---	---	---	---	---	---
OMAHA								
1956	17.45	19.56	14.21	17.16	15.60	20.02	13.58	16.89
1957	20.28	22.50	17.11	20.14	18.28	23.17	16.43	20.02
1958	25.45	29.26	22.66	26.59	26.25	32.26	24.02	28.92
1959	27.09	30.67	23.93	27.85	28.52	34.78	25.87	31.77
1960	23.99	26.61	20.74	24.16	23.47	28.58	21.20	25.71
KANSAS CITY								
1956	17.46	19.67	14.16	17.03	15.50	19.57	13.68	16.92
1957	20.60	22.71	16.97	20.14	18.80	23.36	16.40	20.04
1958	26.50	29.10	23.33	26.41	25.73	31.68	23.80	28.48
1959	27.20	29.76	23.66	27.09	26.73	32.65	24.64	29.58
1960	23.84	26.36	---	23.65	---	27.87	---	24.58

* See asterick next page.

^{a/} See footnote next page.

TABLE XXX. PRICES OF FEEDER CATTLE AND CALVES, 12 MARKETS, 1956-60.* (Continued)

Market	Feeder Cattle				Feeder Calves			
	Steers 500-800#		Heifers 500-800#		Steers 300-500#		Heifers 300-500#	
	Good dollars	Choice dollars	Medium-good dollars	Choice dollars	Medium dollars	Good-choice dollars	Medium dollars	Good-choice dollars
DENVER								
1956	16.66	18.20	14.07	16.38	16.27	19.69	14.03	16.93
1957	19.81	21.84	17.33	19.82	19.51	23.12	17.44	20.33
1958	26.03	27.94	23.35	25.72	28.34	33.31	25.99	30.34
1959	26.93	29.30	23.67	26.71	28.85	34.40	26.27	31.51
1960	24.12	26.21	21.13	23.87	24.95	28.70	22.65	26.37
OGDEN								
1956	15.86	---	13.83	---	---	17.76	---	---
1957	18.89	---	16.94	---	---	21.48	---	---
1958	25.27	---	22.48	---	---	29.40	---	---
1959	26.42	28.36	24.01	---	---	31.93	---	---
1960	23.53	25.51	20.29	---	---	26.75	---	---
PHOENIX ^{a/}								
1957	19.14	20.78	16.77	19.50	18.33	21.21	16.84	19.10
1958	24.26	26.27	21.02	24.69	25.11	28.92	23.41	27.04
1959	25.81	28.62	21.63	26.67	27.66	31.06	25.15	28.99
1960	23.19	24.86	20.08	23.94	23.44	26.43	22.15	24.51
PORTLAND								
1956	16.76	---	---	---	---	16.76	---	---
1957	18.91	---	---	---	---	20.30	---	---
1958	23.66	---	21.15	---	---	27.76	---	---
1959	25.52	---	22.61	---	---	28.85	---	---
1960	22.15	---	19.15	---	---	25.57	---	---
SPOKANE								
1956	16.56	---	12.76	---	---	17.16	---	---
1957	19.88	---	16.39	---	---	21.05	---	---
1958	25.56	---	22.35	---	---	28.46	---	---

* See asterick next page.

^{a/} See footnote next page.

TABLE XXX. PRICES OF FEEDER CATTLE AND CALVES, 12 MARKETS, 1956-60.* (Continued)

Market	Feeder Cattle				Feeder Calves			
	Steers 500-800#		Heifers 500-800#		Steers 300-500#		Heifers 300-500#	
	Good	Choice	Medium-good	Choice	Medium	Good-choice	Medium	Good-choice
	dollars	dollars	dollars	dollars	dollars	dollars	dollars	dollars
SPOKANE								
1959	26.89	---	23.61	---	---	30.14	---	---
1960	22.01	---	19.34	---	---	24.89	---	---
LOS ANGELES								
1956	17.19	---	---	---	---	---	---	---
1957	19.65	---	---	---	18.11	20.86	---	---
1958	25.04	---	---	---	24.76	28.43	---	---
1959	26.39	---	23.68	---	27.02	31.12	23.88	29.10
1960	23.67	---	20.06	---	21.95	25.76	19.90	23.48
STOCKTON								
1956	17.26	18.68	14.02	15.97	16.01	18.53	13.79	15.83
1957	19.56	21.01	16.47	18.40	18.06	20.86	16.66	18.65
1958	25.08	26.60	21.82	24.31	24.96	28.66	23.46	26.49
1959	26.69	28.34	23.08	25.36	26.17	30.43	25.48	28.52
1960	23.52	25.22	19.54	22.93	23.78	26.57	21.11	23.90

* Source: Data obtained from market news reporters of the Agricultural Marketing Service, United States Department of Agriculture.

a/ Data available only for years indicated.

TABLE XXXI. RAIL FREIGHT RATES FOR FEEDER CATTLE AND CALVES, SELECTED POINTS OF ORIGIN AND DESTINATION, 1962.* ^{a/}

To	From	Billings	Chicago	St. Paul	Sioux City	Omaha	Kansas City	Oklahoma City	Ft. Worth	Albuquerque	Denver	Ogden	Idaho Falls	Phoenix	Spokane	Seattle	Portland	San Francisco	Los Angeles
		cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.
Billings		xxx	128	103	100	103	117	150½	157½	140	100½	97	80	187	92	118	118	158	161
Chicago		128	xxx	72	76	76	76	101	114	142	117	166	172	183½	185½	214½	214½	225½	214½
St. Paul		103	72	xxx	61½	65½	75	99	112	136	111	147	141	175	152½	174½	174½	203½	203½
Sioux City		100	76	61½	xxx	38½	61½	80	97	114	84	128	135	159	151½	172½	172½	184½	178
Omaha		103	76	65½	38½	xxx	49½	76	92	109	84	128	135	149	163½	187	187	184½	178
Kansas City		117	76	75	61½	49½	xxx	65½	79	104	84	128	135	126	163½	187	187	184½	178
Oklahoma City		150½	101	99	80	76	65½	xxx	47½	87½	92	138½	150	128½	181	203	200½	183	157½
Ft. Worth		157½	114	112	97	92	79	47½	xxx	93	97	147	156	124½	195½	216	208½	187	156½
Albuquerque		140	142	136	114	109	104	87½	93	xxx	76	124½	135	92	174	194	188	140½	115½
Denver		100½	117	111	84	84	84	92	97	76	xxx	93	101	118	140½	165	165	156½	142
Ogden		97	166	147	128	128	128	138½	147	124½	93	xxx	54½	124	104	120	113	108	112
Idaho Falls		80	172	141	135	135	135	150	156	135	103	54½	xxx	140	192	114	106½	115	124
Phoenix		187	183½	175	159	149	126	128½	124½	92	118	124	140	xxx	175	172	158	108	78
Spokane		92	185½	152½	151½	163½	163½	181	195½	174	140½	104	92	175	xxx	66	69	123	151
Seattle		118	214½	174½	172½	187	187	203	216	194	165	120	114	172	66	xxx	53	115	147
Portland		118	214½	174½	172½	187	187	200½	208½	188	165	113	106½	158	69	53	xxx	103	129
San Francisco		158	225½	203½	184½	184½	184½	183	187	140½	156½	108	115	108	123	115	103	xxx	80
Los Angeles		161	214½	203½	178	178	178	157½	156½	115½	142½	112	124	78	151	147	129	80	xxx

* Source: Data obtained from railroads serving the selected points.

^{a/} Rates for calves, double decked, and cattle single decked, are the same.

TABLE XXXII. ESTIMATES OF POPULATION AND PROJECTED CONSUMPTION OF BEEF, 11 WESTERN STATES, 1970.*

States	Population ^{a/}	Beef Consumption ^{b/}	Population ^{a/}	Beef Consumption ^{c/}
	1960 thou.	1960 mil.lbs.	1970 thou.	1970 mil.lbs.
Montana	675	69.9	826	94.9
Idaho	667	74.1	806	92.7
Wyoming	330	36.7	357	41.1
Colorado	1,754	194.9	2,086	239.9
New Mexico	951	105.7	1,133	130.3
Arizona	1,302	144.7	1,845	212.2
Utah	891	99.0	1,141	131.2
Nevada	285	31.7	400	46.0
Washington	2,853	317.0	3,388	389.6
Oregon	1,769	196.5	2,130	244.9
California	15,717	1,746.2	18,751	2,156.4
United States	177,700	3,016.4	209,570	3,779.2

* Sources: Population estimates from U. S. News and World Report, USN and WR Economic Unit.
 Rex F. Daly, "Agriculture in the 1960's", An address delivered to the Annual Conference of Extension Workers, University of Minnesota, December 7, 1961.

^{a/} Population estimates taken from U. S. News and World Report.

^{b/} United States Department of Agriculture, Food Consumption of Households in the United States, HFC 1, Washington, D. C., United States Government Printing Office, 1956.

^{c/} In a talk by Rex F. Daly, a prediction of a small rise in per capita food consumption was made for 1970. Therefore, the estimate of per capita beef consumption in the Western states was set at 115 pounds, 4.9 pounds more than in 1960.

TABLE XXXIII. RAIL FREIGHT RATES FOR SLAUGHTER CATTLE, SELECTED POINTS OF ORIGIN AND DESTINATION, 1962.*

To	From	Billings	Chicago	St. Paul	Sioux City	Omaha	Kansas City	Oklahoma City	Ft. Worth	Albuquerque	Denver	Ogden	Idaho Falls	Phoenix	Spokane	Seattle	Portland	San Francisco	Los Angeles
		cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.	cents/ cwt.
Billings		xxx	150	122	117	122	139	175	183	165	116	113	109	220	108	139	139	185	188
Chicago		150	xxx	N.A.	N.A.	85	90	118	135	167	139	194	202	216	218	252	252	265	252
St. Paul		122	N.A.	xxx	N.A.	76	89	116	131	161	129	173	166	206	179	205	205	239	239
Sioux City		117	N.A.	N.A.	xxx	45½	72	97	113	135	98	150	159	187	178	203	203	217	209
Omaha		122	85	76	45½	xxx	58½	91	109	127	98	150	159	175	192	220	220	217	209
Kansas City		139	90	89	72	58½	xxx	76	94	124	98	150	159	148	192	220	220	217	209
Oklahoma City		175	118	116	97	91	76	xxx	55½	103	109	163	176½	151	213	239	236	215	185
Ft. Worth		183	135	131	113	109	94	55½	xxx	109	113	173	183½	146½	230	254	245	220	184
Albuquerque		165	167	161	135	127	124	103	109	xxx	89	146	159	108	205	229	221	165	136
Denver		116	139	129	98	98	98	109	113	89	xxx	110	122	139	165	194	194	184	167
Ogden		113	194	173	150	150	150	163	173	146	110	xxx	63½	145	124	140	134	126	131
Idaho Falls		109	202	166	159	159	159	176½	183½	159	122	63½	xxx	165	108	134	125	136	145
Phoenix		220	216	206	187	175	148	151	146½	108	139	145	165	xxx	206	202	184	125	92
Spokane		108	218	179	178	192	192	213	230	205	165	124	108	206	xxx	78	81	143	179
Seattle		139	252	205	203	220	220	239	254	229	194	140	134	202	78	xxx	62½	136	173
Portland		139	252	205	203	220	220	236	245	221	194	134	125	184	81	62½	xxx	122	152
San Francisco		185	265	239	217	217	217	215	220	165	184	126	136	125	143	136	122	xxx	89
Los Angeles		188	252	239	209	209	209	185	184	136	167	131	145	92	179	173	152	89	xxx

* Source: Data obtained from railroads serving the selected points.

TABLE XXXIV. PRICES OF SLAUGHTER CATTLE, 12 MARKETS, 1956-60.*

Market		Slaughter Cattle			
		Steers		Heifers	
		900-1100# good	900-1100# choice	800-1000# good	900-1100# choice
		dollars	dollars	dollars	dollars
Sioux Falls ^{a/}					
	1958	24.63	26.71	23.78	25.74
	1959	25.31	26.68	23.98	25.64
	1960	23.88	25.35	22.73	24.29
Billings					
	1956	17.53	19.48	16.43	18.04
	1957	19.89	21.31	18.58	20.18
	1958	24.22	25.35	23.58	24.81
	1959	24.48	25.97	23.84	25.20
	1960	22.58	24.41	21.01	22.66
Chicago					
	1956	22.71	19.54	18.59	21.14
	1957	21.42	24.07	20.57	22.80
	1958	25.66	28.13	24.98	26.86
	1959	26.26	28.47	25.34	27.11
	1960	24.20	26.57	23.23	25.44
Omaha					
	1956	18.44	21.93	17.73	20.49
	1957	20.58	23.16	19.94	22.21
	1958	24.87	27.20	24.50	26.40
	1959	25.25	25.67	24.42	26.70
	1960	23.34	25.90	22.66	25.21
Kansas City					
	1956	18.67	21.72	17.71	20.61
	1957	20.84	23.29	20.16	22.53
	1958	25.04	27.38	24.65	26.60
	1959	25.47	27.70	24.95	26.96
	1960	23.62	25.93	22.82	25.05
Denver					
	1956	19.03	21.72	18.16	20.77
	1957	20.66	23.27	19.73	22.39
	1958	24.74	27.12	24.53	26.67
	1959	24.68	27.28	24.42	26.82
	1960	22.46	25.57	22.12	25.09

* See asterick on next page.

^{a/} See footnote on next page.

TABLE XXXIV. PRICES OF SLAUGHTER CATTLE, 12 MARKETS, 1956-60.*
(Continued)

Market		Slaughter Cattle			
		Steers		Heifers	
		900-1100# good	900-1100# choice	800-1000# good	900-1100# choice
		dollars	dollars	dollars	dollars
Ogden	1956		19.82		19.44
	1957		21.82		21.62
	1958		26.10		25.98
	1959		26.77		26.88
	1960		24.70		24.62
Phoenix ^{a/}	1957	21.25	22.76	20.19	21.66
	1958	25.54	26.94	24.95	25.97
	1959	25.70	27.22	25.61	26.67
	1960	23.80	25.37	23.54	24.64
Portland	1956		21.49		19.29
	1957		23.29		21.66
	1958		27.40		26.22
	1959		28.28		26.67
	1960		26.43		24.56
Spokane ^{a/}	1956		20.68		
	1957		22.25		
	1958		25.77		
	1959	25.95	27.79	25.24	27.02
	1960	23.14	25.02	22.18	23.74
Los Angeles	1956	19.56	21.10	18.28	19.80
	1957	21.57	23.07	20.73	21.96
	1958	25.74	27.28	24.88	26.20
	1959	25.75	27.54	25.33	26.67
	1960	23.59	25.39	22.59	24.37

* See asterick on next page.

^{a/} See footnote on next page.

TABLE XXXIV. PRICES OF SLAUGHTER CATTLE, 12 MARKETS, 1956-60.*
(Continued)

Market	Slaughter Cattle			
	Steers		Heifers	
	900-1100#	900-1100#	800-1000#	900-1100#
	good	choice	good	choice
	dollars	dollars	dollars	dollars
Stockton				
1956	18.97	20.82	17.62	19.35
1957	21.10	22.75	19.80	21.53
1958	25.11	26.86	24.05	25.47
1959	26.02	27.85	25.05	26.52
1960	24.08	25.85	22.75	24.29

* Source: Data obtained from market news reporters of the Agricultural Marketing Service, United States Department of Agriculture.

a/ Data available only for years indicated.

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